

# 图书情报专题研究

最新学科研究热点与前沿

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2020 年 10 月

# 前 言

《图书情报专题研究》的宗旨是为我校师生开展学术研究提供有价值的参考信息，此项工作由图书馆信息咨询服务部承担。“最新学科研究热点与前沿”根据学校所购买的数字资源，通过分析其深层次的功能，从数据库中组织整理出了与我校学科领域相关的最新学科热点研究论文、最新研究前沿及最新国际会议信息等，以期能对我校师生开展学术研究、项目立项、开题等学术研究活动提供帮助。

本期收集整理了如下七个方面的热点文献和前沿信息：

1、Nature Latest Research, Nature Energy 最新研究进展；

2、IEL Top25, IEL 数据库下载最多的 25 篇论文；

3、ESI (Essential Science Indicators) HOT PAPERS, 按照 ESI 某一学科热点论文被引频次排名选取前 25 篇；

4、ESI (Essential Science Indicators) HIGHLY CITED PAPERS, 按照 ESI 某一学科高被引论文被引频次排名选取前 25 篇；

5、AIAA、IAF 最新会议，由 AIAA、IAF 主站提供的最新会议信息，可供相关研究者参考；

6、ACM 最新会议，根据 ACM 主页所提供的最新会议信息整理所得，可供相关研究者参考；

7、IQPC 最新会议，由国际质量与竞争力中心 (IQPC: International Quality and Productivity Center) 提供的最新国际会议，内容涉及国防、能源、工业、科技、电信等领域。IQPC 是国际顶级的会议展览策划公司，于 1973 年成立于美国，旨在为全球业务主管提供量身定制的会议、大型会展以及培训课程，积极为行业人士的相互交流创建平台，使业内人士能够随时掌握行业发展的最新趋势及技术创新。

如果您对我们的栏目设置、内容编排等有好的意见和建议，欢迎与我们联系 (电话：88492928)，我们将积极采纳，使这份电子刊物日臻完善，共同为把我校建成学科特色鲜明的世界一流大学而努力。

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## *NatureLatest Research(Energy)*

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来源: <https://www.nature.com/nenergy/>

1. 标题: Mental accounting mechanisms in energy decision-making and behaviour

作者: Ulf J. J. Hahnel, Gilles Chatelain, Beatrice Conte, Valentino Piana & Tobias Brosch

摘要: Mental accounting refers to the fact that people create mental budgets to organize their resource use and to create linkages between specific acts of consumption and specific payments. Research on financial decision-making and consumer behaviour shows that these mechanisms can have a large impact on decisions and behaviours, deviating from normative economic principles. Here we introduce a theoretical framework illustrating how mental accounting mechanisms may influence individual decisions and behaviours driving energy consumption and carbon emissions. We demonstrate the practical relevance of mental accounting in the context of designing carbon pricing mechanisms and discuss the ethical dimensions of applying the concept to intervention design. By bridging the mental accounting literature and research in the energy domain, we aim to stimulate the study of the cognitive mechanisms underlying energy-relevant decisions and the development of novel theory-based interventions targeting reductions of energy use and carbon emissions.

链接: <https://www.nature.com/articles/s41560-020-00704-6>

2. 标题: All-perovskite tandem solar cells with 24.2% certified efficiency and area over 1 cm<sup>2</sup> using surface-anchoring zwitterionic antioxidant

作者: Ke Xiao, Renxing Lin, Qiaolei Han, Yi Hou, Zhenyuan Qin, Hieu T. Nguyen, Jin Wen, Mingyang Wei, Vishal Yeddu, Makhsud I. Saidaminov, Yuan Gao, Xin Luo, Yurui Wang, Han Gao, Chunfeng Zhang, Jun Xu, Jia Zhu, Edward H. Sargent & Hairen Tan

摘要: Monolithic all-perovskite tandem solar cells offer an avenue to increase power conversion efficiency beyond the limits of single-junction cells. It is an important priority to unite efficiency, uniformity and stability, yet this has proven challenging because of high trap density and ready oxidation in narrow-bandgap mixed lead–tin perovskite subcells. Here we report simultaneous enhancements in the efficiency, uniformity and stability of narrow-bandgap subcells using strongly reductive surface-anchoring zwitterionic molecules. The zwitterionic antioxidant inhibits Sn<sup>2+</sup> oxidation and passivates defects at the grain surfaces in mixed lead–tin perovskite films, enabling an efficiency of 21.7% (certified 20.7%) for single-junction solar cells. We further obtain a certified efficiency of 24.2% in 1-cm<sup>2</sup>-area all-perovskite tandem cells and in-lab power conversion efficiencies of 25.6% and 21.4% for 0.049 cm<sup>2</sup> and 12 cm<sup>2</sup> devices, respectively. The encapsulated tandem devices retain 88% of their initial performance following 500 hours of operation at a device temperature of 54–60 °C under one-sun illumination in ambient conditions.

链接: <https://www.nature.com/articles/s41560-020-00705-5>

3.标题: Differences in carbon emissions reduction between countries pursuing renewable electricity versus nuclear power

作者: Benjamin K. Sovacool, Patrick Schmid, Andy Stirling, Goetz Walter & Gordon MacKerron

摘要: Two of the most widely emphasized contenders for carbon emissions reduction in the electricity sector are nuclear power and renewable energy. While scenarios regularly question the potential impacts of adoption of various technology mixes in the future, it is less clear which technology has been associated with greater historical emission reductions. Here, we use multiple regression analyses on global datasets of national carbon emissions and renewable and nuclear electricity production across 123 countries over 25 years to examine systematically patterns in how countries variously using nuclear power and renewables contrastingly show higher or lower carbon emissions. We find that larger-scale national nuclear attachments do not tend to associate with significantly lower carbon emissions while renewables do. We also find a negative association between the scales of national nuclear and renewables attachments. This suggests nuclear and renewables attachments tend to crowd each other out.

链接: <https://www.nature.com/articles/s41560-020-00696-3>

4.标题: Heuristic solution for achieving long-term cycle stability for Ni-rich layered cathodes at full depth of discharge

作者: Un-Hyuck Kim, Geon-Tae Park, Byoung-Ki Son, Gyeong Won Nam, Jun Liu, Liang-Yin Kuo, Payam Kaghazchi, Chong S. Yoon & Yang-Kook Sun

摘要: The demand for energy sources with high energy densities continues to push the limits of Ni-rich layered oxides, which are currently the most promising cathode materials in automobile batteries. Although most current research is focused on extending battery life using Ni-rich layered cathodes, long-term cycling stability using a full cell is yet to be demonstrated. Here, we introduce  $\text{Li}[\text{Ni}_{0.90}\text{Co}_{0.09}\text{Ta}_{0.01}]\text{O}_2$ , which exhibits 90% capacity retention after 2,000 cycles at full depth of discharge (DOD) and a cathode energy density  $>850 \text{ Wh kg}^{-1}$ . In contrast, the currently most sought-after  $\text{Li}[\text{Ni}_{0.90}\text{Co}_{0.09}\text{Al}_{0.01}]\text{O}_2$  cathode loses ~40% of its initial capacity within 500 cycles at full DOD. Cycling stability is achieved by radially aligned primary particles with [003] crystallographic texture that effectively dissipate the internal strain occurring in the deeply charged state, while the substitution of  $\text{Ni}^{3+}$  with higher valence ions induces ordered occupation of Ni ions in the Li slab and stabilizes the delithiated structure.

链接: <https://www.nature.com/articles/s41560-020-00693-6>

5.标题: Increase in domestic electricity consumption from particulate air pollution

作者: Pan He, Jing Liang, Yueming (Lucy) Qiu, Qingran Li & Bo Xing

摘要: Accurate assessment of environmental externalities of particulate air pollution is crucial to the design and evaluation of environmental policies. Current evaluations mainly focus on direct damages resulting from exposure, missing indirect co-damages that occur through interactions among the externalities, human behaviours and technologies. Our study provides an empirical assessment of such co-damages using customer-level daily and hourly electricity data of a large sample of residential and commercial consumers in Arizona, United States. We use an instrumental variable panel regression approach and find that particulate matter air pollution increases electricity consumption in residential buildings as well as in retail and recreation service industries. Air

pollution also reduces the actual electricity generated by distributed-solar panels. Lower-income and minority ethnic groups are disproportionately impacted by air pollution and pay higher electricity bills associated with pollution avoidance, stressing the importance of incorporating the consideration of environmental justice in energy policy-making.

链接: <https://www.nature.com/articles/s41560-020-00699-0>

6. 标题: First-cycle voltage hysteresis in Li-rich 3d cathodes associated with molecular O<sub>2</sub> trapped in the bulk

作者: Robert A. House, Gregory J. Rees, Miguel A. Pérez-Osorio, John-Joseph Marie, Edouard Boivin, Alex W. Robertson, Abhishek Nag, Mirian Garcia-Fernandez, Ke-Jin Zhou & Peter G. Bruce

摘要: Li-rich cathode materials are potential candidates for next-generation Li-ion batteries. However, they exhibit a large voltage hysteresis on the first charge/discharge cycle, which involves a substantial (up to 1 V) loss of voltage and therefore energy density. For Na cathodes, for example Na<sub>0.75</sub>[Li<sub>0.25</sub>Mn<sub>0.75</sub>]O<sub>2</sub>, voltage hysteresis can be explained by the formation of molecular O<sub>2</sub> trapped in voids within the particles. Here we show that this is also the case for Li<sub>1.2</sub>Ni<sub>0.13</sub>Co<sub>0.13</sub>Mn<sub>0.54</sub>O<sub>2</sub>. Resonant inelastic X-ray scattering and <sup>17</sup>O magic angle spinning NMR spectroscopy show that molecular O<sub>2</sub>, rather than O<sub>2</sub><sup>2-</sup>, forms within the particles on the oxidation of O<sub>2</sub><sup>-</sup> at 4.6 V versus Li<sup>+</sup>/Li on charge. These O<sub>2</sub> molecules are reduced back to O<sub>2</sub><sup>-</sup> on discharge, but at the lower voltage of 3.75 V, which explains the voltage hysteresis in Li-rich cathodes. <sup>17</sup>O magic angle spinning NMR spectroscopy indicates a quantity of bulk O<sub>2</sub> consistent with the O-redox charge capacity minus the small quantity of O<sub>2</sub> loss from the surface. The implication is that O<sub>2</sub>, trapped in the bulk and lost from the surface, can explain O-redox.

链接: <https://www.nature.com/articles/s41560-020-00697-2>

7. 标题: Increase in household energy consumption due to ambient air pollution

作者: Jiyong Eom, Minwoo Hyun, Jaewoong Lee & Hyoseop Lee

摘要: In response to acute environmental stresses such as air pollution, households may resort to quick and convenient adaptation measures that increase energy use, amplifying the environmental impact and requiring additional adaptation. This cycle of energy-intensive adaptation has so far received little consideration by the broader energy community. Here, we analyse the response of Korean households to PM<sub>2.5</sub> (ultrafine dust), based on real-time hourly smart meter data. We show that a 75 μg m<sup>-3</sup> increase in PM<sub>2.5</sub> concentration led to an 11.2% increase in electricity consumption, equivalent to the impact of a 3.5 °C increase in the average summer temperature. The magnitude of the energy-intensive adaptation correlated with households' lifestyles and was higher on weekends and during daytime hours on both weekdays and weekends. The responses also reflected seasonal differences and had a U-shape relationship with temperature. We illustrate the importance of integrating the broader impacts of air pollution into policymaking to strike a proper balance between its mitigation and adaptation.

链接: <https://www.nature.com/articles/s41560-020-00698-1>

8.标题: Interplay between temperature and bandgap energies on the outdoor performance of perovskite/silicon tandem solar cells

作者: Erkan Aydin, Thomas G. Allen, Michele De Bastiani, Lujia Xu, Jorge Ávila, Michael Salvador, Emmanuel Van Kerschaver & Stefaan De Wolf

摘要: Perovskite/silicon tandem solar cells promise power conversion efficiencies beyond the Shockley–Queisser limit of single-junction devices; however, their actual outdoor performance is yet to be investigated. Here we fabricate 25% efficient two-terminal monolithic perovskite/silicon tandem solar cells and test them outdoors in a hot and sunny climate. We find that the temperature dependence of both the silicon and perovskite bandgaps—which follow opposing trends—shifts the devices away from current matching for two-terminal tandems that are optimized at standard test conditions. Consequently, we argue that the optimal perovskite bandgap energy at standard test conditions is  $<1.68$  eV for field performance at operational temperatures greater than  $55$  °C, which is lower compared with earlier findings. This implies that bromide-lean perovskites with narrower bandgaps at standard test conditions—and therefore better phase stability—hold great promise for the commercialization of perovskite/silicon tandem solar cells.

链接: <https://www.nature.com/articles/s41560-020-00687-4>

9.标题: Patenting and business outcomes for cleantech startups funded by the Advanced Research Projects Agency-Energy

作者: Anna Goldstein, Claudia Doblinger, Erin Baker & Laura Díaz Anadón

摘要: Innovation to reduce the cost of clean technologies has large environmental and societal benefits. Governments can play an important role in helping cleantech startups innovate and overcome risks involved in technology development. Here we examine the impact of the US Advanced Research Projects Agency-Energy (ARPA-E) on two outcomes for startup companies: innovation (measured by patenting activity) and business success (measured by venture capital funding raised, survival, and acquisition or initial public offering). We compare 25 startups funded by ARPA-E in 2010 to rejected ARPA-E applicants, startups funded by a related government programme and other comparable cleantech startups. We find that ARPA-E awardees have a strong innovation advantage over all the comparison groups. However, while we find that ARPA-E awardees performed better than rejected applicants in terms of post-award business success, we do not detect significant differences compared to other cleantech startups. These findings suggest that ARPA-E was not able to fully address the ‘valley of death’ for cleantech startups within 10–15 yr after founding.

链接: <https://www.nature.com/articles/s41560-020-00683-8>

10.标题: Ambient-pressure and low-temperature upgrading of lignin bio-oil to hydrocarbons using a hydrogen buffer catalytic system

作者: Wei Liu, Wenqin You, Wei Sun, Weisheng Yang, Akshay Korde, Yutao Gong & Yulin Deng

摘要: Catalytic hydrodeoxygenation is an essential step for bio-oil upgrading. However, hydrodeoxygenation usually requires a high hydrogen pressure and high temperature due to the good stability of the C–O bonds. Here we report an effective multiphase hydrodeoxygenation of lignin-based bio-oil at temperatures  $<100$  °C and hydrogen pressures  $<1$  atm using a synergetic catalyst system that consists of a low redox potential  $H_4SiW_{12}O_{40}$  (SiW<sub>12</sub>) and suspended Pt-on-carbon (Pt/C) particles. We propose that SiW<sub>12</sub> plays three critical roles in bio-oil

hydrodeoxygenation. First, it quickly oxidizes the H<sub>2</sub> gas to form reduced SiW<sub>12</sub> in the presence of Pt/C. Second, it transfers both electrons and H<sup>+</sup> ions to the bulk phase to form active H\* or H<sub>2</sub> on the Pt/C surface. Third, the formation of the oxonium ion in a SiW<sub>12</sub> superacid solution reduces the deoxygenation energy. The SiW<sub>12</sub>-enhanced proton-transfer hydrodeoxygenation mechanism is supported by density functional theory computations. As a result of the hydrogen buffer and acidic effect, up to a 90% yield of hydrocarbons (cyclohexane, benzene and their derivatives) was achieved from the hydrodeoxygenation of phenol and its derivatives.

链接: <https://www.nature.com/articles/s41560-020-00680-x>

11.标题: The role of exciton lifetime for charge generation in organic solar cells at negligible energy-level offsets

作者: Andrej Classen, Christos L. Chochos, Larry Lüer, Vasilis G. Gregoriou, Jonas Wortmann, Andres Osvet, Karen Forberich, Iain McCulloch, Thomas Heumüller & Christoph J. Brabec

摘要: Organic solar cells utilize an energy-level offset to generate free charge carriers. Although a very small energy-level offset increases the open-circuit voltage, it remains unclear how exactly charge generation is affected. Here we investigate organic solar cell blends with highest occupied molecular orbital energy-level offsets ( $\Delta E_{\text{HOMO}}$ ) between the donor and acceptor that range from 0 to 300 meV. We demonstrate that exciton quenching at a negligible  $\Delta E_{\text{HOMO}}$  takes place on timescales that approach the exciton lifetime of the pristine materials, which drastically limits the external quantum efficiency. We quantitatively describe this finding via the Boltzmann stationary-state equilibrium between charge-transfer states and excitons and further reveal a long exciton lifetime to be decisive in maintaining an efficient charge generation at a negligible  $\Delta E_{\text{HOMO}}$ . Moreover, the Boltzmann equilibrium quantitatively describes the major reduction in non-radiative voltage losses at a very small  $\Delta E_{\text{HOMO}}$ . Ultimately, highly luminescent near-infrared emitters with very long exciton lifetimes are suggested to enable highly efficient organic solar cells.

链接: <https://www.nature.com/articles/s41560-020-00684-7>

12.标题: Effects of technology complexity on the emergence and evolution of wind industry manufacturing locations along global value chains

作者: Kavita Surana, Claudia Doblinger, Laura Diaz Anadon & Nathan Hultman

摘要: Wind energy can contribute to national climate, energy and economic goals by expanding clean energy and supporting economies through new manufacturing industries. However, the mechanisms for achieving these interlinked goals are not well understood. Here we analyse the wind energy manufacturing global value chain, using a dataset on 389 component supplier firms (2006–2016) that work with 13 original equipment manufacturers. We assess how technology complexity, that is, the knowledge intensity and difficulty of manufacturing components, shapes the location of suppliers. For countries without existing wind industries, we find evidence of the emergence of suppliers for only low-complexity components (for example, towers and generators). For countries with existing wind industries, we find that suppliers' evolution, that is, changes in their international supply relationships, is less likely for high-complexity components (for example, blades and gearboxes). Our findings show the importance of understanding technologies along with firms and countries within global value chains for achieving policy goals.

链接: <https://www.nature.com/articles/s41560-020-00685-6>



13. **标题:** A global analysis of the progress and failure of electric utilities to adapt their portfolios of power-generation assets to the energy transition

**作者:** Galina Alova

**摘要:** The penetration of low-carbon technologies in power generation has challenged fossil-fuel-focused electric utilities. While the extant, predominantly qualitative, literature highlights diversification into renewables among possible adaptation strategies, comprehensive quantitative understanding of utilities' portfolio decarbonization has been missing. This study bridges this gap, systematically quantifying the transitions of over 3,000 utilities worldwide from fossil-fuelled capacity to renewables over the past two decades. It applies a machine-learning-based clustering algorithm to a historical global asset-level dataset, distilling four macro-behaviours and sub-patterns within them. Three-quarters of the utilities did not expand their portfolios. Of the remaining companies, a handful grew coal ahead of other assets, while half favoured gas and the rest prioritized renewables growth. Strikingly, 60% of the renewables-prioritizing utilities had not ceased concurrently expanding their fossil-fuel portfolio, compared to 15% reducing it. These findings point to electricity system inertia and the utility-driven risk of carbon lock-in and asset stranding.

**链接:** <https://www.nature.com/articles/s41560-020-00686-5>

14. **标题:** The short-term costs of local content requirements in the Indian solar auctions

**作者:** Benedict Probst, Vasilios Anatolitis, Andreas Kontoleon & Laura Díaz Anadón

**摘要:** Developing and emerging economies are implementing local content requirements to spur domestic manufacturing, though their costs and benefits are not well understood and difficult to quantify. Here, we provide an empirical assessment of the short-term costs of local content requirements using a credible counterfactual. We analyse data on government-run solar photovoltaic auctions held in India between 2014 and 2017 and exploit the fact that not all of the auctioned contracts entailed local content requirements. We find that local content requirement policies resulted in a ~6% per kWh increase in the cost of solar photovoltaic power generated from those projects when compared to similar projects not subject to the same local content requirement policy. During this three-year time period, Indian solar panels remained around 14% more expensive than international panels. We found some evidence of short-term increases in domestic manufacturing capacity, yet during this short period Indian firms did not increase market share or break into export markets.

**链接:** <https://www.nature.com/articles/s41560-020-0677-7>

15. **标题:** Molecularly engineered photocatalyst sheet for scalable solar formate production from carbon dioxide and water

**作者:** Qian Wang, Julien Warnan, Santiago Rodríguez-Jiménez, Jane J. Leung, Shafeer Kalathil, Virgil Andrei, Kazunari Domen & Erwin Reisner

**摘要:** Harvesting solar energy to convert CO<sub>2</sub> into chemical fuels is a promising technology to curtail the growing atmospheric CO<sub>2</sub> levels and alleviate the global dependence on fossil fuels; however, the assembly of efficient and robust systems for the selective photoconversion of CO<sub>2</sub> without sacrificial reagents and external bias remains a challenge. Here we present a photocatalyst sheet that converts CO<sub>2</sub> and H<sub>2</sub>O into formate and O<sub>2</sub> as a potentially scalable technology for CO<sub>2</sub> utilization. This technology integrates lanthanum- and rhodium-doped SrTiO<sub>3</sub> (SrTiO<sub>3</sub>:La,Rh) and

molybdenum-doped BiVO<sub>4</sub> (BiVO<sub>4</sub>:Mo) light absorbers modified by phosphonated Co(II) bis(terpyridine) and RuO<sub>2</sub> catalysts onto a gold layer. The monolithic device provides a solar-to-formate conversion efficiency of  $0.08 \pm 0.01\%$  with a selectivity for formate of  $97 \pm 3\%$ . As the device operates wirelessly and uses water as an electron donor, it offers a versatile strategy toward scalable and sustainable CO<sub>2</sub> reduction using molecular-based hybrid photocatalysts.

链接: <https://www.nature.com/articles/s41560-020-0678-6>

16.标题: Operando decoding of chemical and thermal events in commercial Na(Li)-ion cells via optical sensors

作者: Jiaqiang Huang, Laura Albero Blanquer, Julien Bonafacino, E. R. Logan, Daniel Alves Dalla Corte, Charles Delacourt, Betar M. Gallant, Steven T. Boles, J. R. Dahn, Hwa-Yaw Tam & Jean-Marie Tarascon

摘要: Monitoring the dynamic chemical and thermal state of a cell during operation is crucial to making meaningful advancements in battery technology as safety and reliability cannot be compromised. Here we demonstrate the feasibility of incorporating optical fibre Bragg grating sensors into commercial 18650 cells. By adjusting fibre morphologies, wavelength changes associated with both temperature and pressure are decoupled with high accuracy, which allows tracking of chemical events such as solid electrolyte interphase formation and structural evolution. We also demonstrate how multiple sensors are used to determine the heat generated by the cell without resorting to microcalorimetry. Unlike with conventional isothermal calorimetry, the cell's heat capacity contribution is readily assessed, allowing for full parametrization of the thermal model. Collectively, these findings offer a scalable solution for screening electrolyte additives, rapidly identifying the best formation processes of commercial cells and designing battery thermal management systems with enhanced safety.

链接: <https://www.nature.com/articles/s41560-020-0665-y>

17.标题: Benefits and costs of a utility-ownership business model for residential rooftop solar photovoltaics

作者: Galen Barbose & Andrew J. Satchwell

摘要: The rapid growth of rooftop solar photovoltaic systems can pose a number of financial challenges for electric utility shareholders and their customers. One potential pathway to resolving these perceived challenges involves allowing utilities to own and operate rooftop solar systems. However, the financial benefits and costs of this business model are not well understood. Here we model the financial performance of a large-scale utility-owned residential rooftop solar programme. Over a 20 yr period, the programme increases shareholder earnings by 2–5% relative to a no-solar scenario, compared to a 2% earnings loss when an equivalent amount of rooftop solar is instead owned by non-utility parties. Such a programme could therefore be attractive from the perspective of utility investors. The impacts on utility customers, however, are more mixed, with average bills of non-solar customers increasing by 1–3% compared to the no-solar scenario, similar to the 2% increase under traditional, non-utility-ownership structures.

链接: <https://www.nature.com/articles/s41560-020-0673-y>

18.标题: Realizing high zinc reversibility in rechargeable batteries

作者: Lin Ma, Marshall A. Schroeder, Oleg Borodin, Travis P. Pollard, Michael S. Ding, Chunsheng Wang & Kang Xu

摘要: Rechargeable zinc metal batteries (RZMBs) offer a compelling complement to existing lithium ion and emerging lithium metal batteries for meeting the increasing energy storage demands of the future. Multiple recent reports have suggested that optimized electrolytes resolve a century-old challenge for RZMBs by achieving extremely reversible zinc plating/stripping with Coulombic efficiencies (CEs) approaching 100%. However, the disparity among published testing methods and conditions severely convolutes electrolyte performance comparisons. The lack of rigorous and standardized protocols is rapidly becoming an impediment to ongoing research and commercialization thrusts. This Perspective examines recent efforts to improve the reversibility of the zinc metal anode in terms of key parameters, including CE protocols, plating morphology, dendrite formation and long-term stability. Then we suggest the most appropriate standard protocols for future CE determination. Finally, we envision future strategies to improve zinc/electrolyte stability so that research efforts can be better aligned towards realistic performance targets for RZMB commercialization.

链接: <https://www.nature.com/articles/s41560-020-0674-x>

19.标题: Challenges and prospects for negawatt trading in light of recent technological developments

作者: Wayes Tushar, Tapan K. Saha, Chau Yuen, David Smith, Peta Ashworth, H. Vincent Poor & Subarna Basnet

摘要: With the advancement of the smart grid, the current energy system is moving towards a future where people can buy what they need, can sell when they have excess and can trade the right of buying to other proactive consumers (prosumers). Although the first two schemes already exist in the market, selling the right of buying — also known as negawatt trading — is something that is yet to be implemented. Here we review the challenges and prospects of negawatt trading in light of recent technological advancements. Through reviewing a number of emerging technologies, we show that the necessary methodologies that are needed to establish negawatt trading as a feasible energy management scheme in the smart grid are already available. Grid interactive buildings and distributed ledger technologies, for instance, can ensure active participation and fair pricing. However, some additional challenges need to be addressed for fully functional negawatt trading mechanisms in today's energy market.

链接: <https://www.nature.com/articles/s41560-020-0671-0>

20.标题: Diagnosing and correcting anode-free cell failure via electrolyte and morphological analysis

作者: A. J. Louli, A. Eldesoky, Rochelle Weber, M. Genovese, Matt Coon, Jack deGooyer, Zhe Deng, R. T. White, Jaehan Lee, Thomas Rodgers, R. Petibon, S. Hy, Shawn J. H. Cheng & J. R. Dahn

摘要: Anode-free lithium metal cells store 60% more energy per volume than conventional lithium-ion cells. Such high energy density can increase the range of electric vehicles by approximately 280 km or even enable electrified urban aviation. However, these cells tend to experience rapid capacity loss and short cycle life. Furthermore, safety issues concerning metallic lithium often remain unaddressed in the literature. Recently, we demonstrated long-lifetime anode-free cells using a dual-salt carbonate electrolyte. Here we characterize the degradation of



anode-free cells with this lean ( $2.6 \text{ g Ah}^{-1}$ ) liquid electrolyte. We observe deterioration of the pristine lithium morphology using scanning electron microscopy and X-ray tomography, and diagnose the cause as electrolyte degradation and depletion using nuclear magnetic resonance spectroscopy and ultrasonic transmission mapping. For the safety characterization tests, we measure the cell temperature during nail penetration. Finally, we use the insights gained in this work to develop an optimized electrolyte, extending the lifetime of anode-free cells to 200 cycles.

链接: <https://www.nature.com/articles/s41560-020-0668-8>



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## *IEL Top25*

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(来源: <http://ieeexplore.ieee.org/>)

1. 标题: Deep Learning Applications in Medical Image Analysis

出处: IEEE Access

作者: Justin Ker;Lipo Wang;Jai Rao;Tchoyoson Lim

摘要: The tremendous success of machine learning algorithms at image recognition tasks in recent years intersects with a time of dramatically increased use of electronic medical records and diagnostic imaging. This review introduces the machine learning algorithms as applied to medical image analysis, focusing on convolutional neural networks, and emphasizing clinical aspects of the field. The advantage of machine learning in an era of medical big data is that significant hierarchal relationships within the data can be discovered algorithmically without laborious hand-crafting of features. We cover key research areas and applications of medical image classification, localization, detection, segmentation, and registration. We conclude by discussing research obstacles, emerging trends, and possible future directions.

链接: <https://ieeexplore.ieee.org/document/8241753>

2. 标题: VINS-Mono: A Robust and Versatile Monocular Visual-Inertial State Estimator

出处: IEEE Transactions on Robotics

作者: Tong Qin;Peiliang Li;Shaojie Shen

摘要: One camera and one low-cost inertial measurement unit (IMU) form a monocular visual-inertial system (VINS), which is the minimum sensor suite (in size, weight, and power) for the metric six degrees-of-freedom (DOF) state estimation. In this paper, we present VINS-Mono: a robust and versatile monocular visual-inertial state estimator. Our approach starts with a robust procedure for estimator initialization. A tightly coupled, nonlinear optimization-based method is used to obtain highly accurate visual-inertial odometry by fusing preintegrated IMU measurements and feature observations. A loop detection module, in combination with our tightly coupled formulation, enables relocalization with minimum computation. We additionally perform 4-DOF pose graph optimization to enforce the global consistency. Furthermore, the proposed system can reuse a map by saving and loading it in an efficient way. The current and previous maps can be merged together by the global pose graph optimization. We validate the performance of our system on public datasets and real-world experiments and compare against other state-of-the-art algorithms. We also perform an onboard closed-loop autonomous flight on the microaerial-vehicle platform and port the algorithm to an iOS-based demonstration. We highlight that the proposed work is a reliable, complete, and versatile system that is applicable for different applications that require high accuracy in localization. We open source our implementations for both PCs (<https://github.com/HKUST-Aerial-Robotics/VINS-Mono>) and iOS mobile devices

链接: <https://ieeexplore.ieee.org/document/8421746>



3. 标题: Convolutional Neural Networks for P300 Detection with Application to Brain-Computer Interfaces

出处: IEEE Transactions on Pattern Analysis and Machine Intelligence

作者: Hubert Cecotti;Axel Graser

摘要: A Brain-Computer Interface (BCI) is a specific type of human-computer interface that enables the direct communication between human and computers by analyzing brain measurements. Oddball paradigms are used in BCI to generate event-related potentials (ERPs), like the P300 wave, on targets selected by the user. A P300 speller is based on this principle, where the detection of P300 waves allows the user to write characters. The P300 speller is composed of two classification problems. The first classification is to detect the presence of a P300 in the electroencephalogram (EEG). The second one corresponds to the combination of different P300 responses for determining the right character to spell. A new method for the detection of P300 waves is presented. This model is based on a convolutional neural network (CNN). The topology of the network is adapted to the detection of P300 waves in the time domain. Seven classifiers based on the CNN are proposed: four single classifiers with different features set and three multiclassifiers. These models are tested and compared on the Data set II of the third BCI competition. The best result is obtained with a multiclassifier solution with a recognition rate of 95.5 percent, without channel selection before the classification. The proposed approach provides also a new way for analyzing brain activities due to the receptive field of the CNN models.

链接: <https://ieeexplore.ieee.org/document/5492691>

4. 标题: A Survey of Clustering With Deep Learning: From the Perspective of Network Architecture

出处: IEEE Access

作者: Erxue Min;Xifeng Guo;Qiang Liu;Gen Zhang;Jianjing Cui;Jun Long

摘要: Clustering is a fundamental problem in many data-driven application domains, and clustering performance highly depends on the quality of data representation. Hence, linear or non-linear feature transformations have been extensively used to learn a better data representation for clustering. In recent years, a lot of works focused on using deep neural networks to learn a clustering-friendly representation, resulting in a significant increase of clustering performance. In this paper, we give a systematic survey of clustering with deep learning in views of architecture. Specifically, we first introduce the preliminary knowledge for better understanding of this field. Then, a taxonomy of clustering with deep learning is proposed and some representative methods are introduced. Finally, we propose some interesting future opportunities of clustering with deep learning and give some conclusion remarks.

链接: <https://ieeexplore.ieee.org/document/8412085>

5. 标题: Wireless Communications Through Reconfigurable Intelligent Surfaces

出处: IEEE Access

作者: Ertugrul Basar;Marco Di Renzo;Julien De Rosny;Merouane Debbah;Mohamed-Slim Alouini;Rui Zhang

摘要: The future of mobile communications looks exciting with the potential new use cases and challenging requirements of future 6th generation (6G) and beyond wireless networks. Since the beginning of the modern era of wireless communications, the propagation medium has been

perceived as a randomly behaving entity between the transmitter and the receiver, which degrades the quality of the received signal due to the uncontrollable interactions of the transmitted radio waves with the surrounding objects. The recent advent of reconfigurable intelligent surfaces in wireless communications enables, on the other hand, network operators to control the scattering, reflection, and refraction characteristics of the radio waves, by overcoming the negative effects of natural wireless propagation. Recent results have revealed that reconfigurable intelligent surfaces can effectively control the wavefront, e.g., the phase, amplitude, frequency, and even polarization, of the impinging signals without the need of complex decoding, encoding, and radio frequency processing operations. Motivated by the potential of this emerging technology, the present article is aimed to provide the readers with a detailed overview and historical perspective on state-of-the-art solutions, and to elaborate on the fundamental differences with other technologies, the most important open research issues to tackle, and the reasons why the use of reconfigurable intelligent surfaces necessitates to rethink the communication-theoretic models currently employed in wireless networks. This article also explores theoretical performance limits of reconfigurable intelligent surface-assisted communication systems using mathematical techniques and elaborates on the potential use cases of intelligent surfaces in 6G and beyond wireless networks.

链接: <https://ieeexplore.ieee.org/document/8796365>

6. 标题: Visibility in bad weather from a single image

出处: 2008 IEEE Conference on Computer Vision and Pattern Recognition

作者: Robby T. Tan

摘要: Bad weather, such as fog and haze, can significantly degrade the visibility of a scene. Optically, this is due to the substantial presence of particles in the atmosphere that absorb and scatter light. In computer vision, the absorption and scattering processes are commonly modeled by a linear combination of the direct attenuation and the airlight. Based on this model, a few methods have been proposed, and most of them require multiple input images of a scene, which have either different degrees of polarization or different atmospheric conditions. This requirement is the main drawback of these methods, since in many situations, it is difficult to be fulfilled. To resolve the problem, we introduce an automated method that only requires a single input image. This method is based on two basic observations: first, images with enhanced visibility (or clear-day images) have more contrast than images plagued by bad weather; second, airlight whose variation mainly depends on the distance of objects to the viewer, tends to be smooth. Relying on these two observations, we develop a cost function in the framework of Markov random fields, which can be efficiently optimized by various techniques, such as graph-cuts or belief propagation. The method does not require the geometrical information of the input image, and is applicable for both color and gray images.

链接: <https://ieeexplore.ieee.org/document/4587643>

7. 标题: Deep Learning COVID-19 Features on CXR Using Limited Training Data Sets

出处: IEEE Transactions on Medical Imaging

作者: Yujin Oh; Sangjoon Park; Jong Chul Ye

摘要: Under the global pandemic of COVID-19, the use of artificial intelligence to analyze chest X-ray (CXR) image for COVID-19 diagnosis and patient triage is becoming important. Unfortunately, due to the emergent nature of the COVID-19 pandemic, a systematic collection of CXR data set for

deep neural network training is difficult. To address this problem, here we propose a patch-based convolutional neural network approach with a relatively small number of trainable parameters for COVID-19 diagnosis. The proposed method is inspired by our statistical analysis of the potential imaging biomarkers of the CXR radiographs. Experimental results show that our method achieves state-of-the-art performance and provides clinically interpretable saliency maps, which are useful for COVID-19 diagnosis and patient triage.

链接: <https://ieeexplore.ieee.org/document/9090149>

8. 标题: Taking the Human Out of the Loop: A Review of Bayesian Optimization

出处: Proceedings of the IEEE

作者: Bobak Shahriari;Kevin Swersky;Ziyu Wang;Ryan P. Adams;Nando de Freitas

摘要: Big Data applications are typically associated with systems involving large numbers of users, massive complex software systems, and large-scale heterogeneous computing and storage architectures. The construction of such systems involves many distributed design choices. The end products (e.g., recommendation systems, medical analysis tools, real-time game engines, speech recognizers) thus involve many tunable configuration parameters. These parameters are often specified and hard-coded into the software by various developers or teams. If optimized jointly, these parameters can result in significant improvements. Bayesian optimization is a powerful tool for the joint optimization of design choices that is gaining great popularity in recent years. It promises greater automation so as to increase both product quality and human productivity. This review paper introduces Bayesian optimization, highlights some of its methodological aspects, and showcases a wide range of applications.

链接: <https://ieeexplore.ieee.org/document/7352306>

9. 标题: A Survey on the Internet of Things (IoT) Forensics: Challenges, Approaches, and Open Issues

出处: IEEE Communications Surveys & Tutorials

作者: Maria Stoyanova;Yannis Nikoloudakis;Spyridon Panagiotakis;Evangelos Pallis;Evangelos K. Markakis

摘要: Today is the era of the Internet of Things (IoT). The recent advances in hardware and information technology have accelerated the deployment of billions of interconnected, smart and adaptive devices in critical infrastructures like health, transportation, environmental control, and home automation. Transferring data over a network without requiring any kind of human-to-computer or human-to-human interaction, brings reliability and convenience to consumers, but also opens a new world of opportunity for intruders, and introduces a whole set of unique and complicated questions to the field of Digital Forensics. Although IoT data could be a rich source of evidence, forensics professionals cope with diverse problems, starting from the huge variety of IoT devices and non-standard formats, to the multi-tenant cloud infrastructure and the resulting multi-jurisdictional litigations. A further challenge is the end-to-end encryption which represents a trade-off between users' right to privacy and the success of the forensics investigation. Due to its volatile nature, digital evidence has to be acquired and analyzed using validated tools and techniques that ensure the maintenance of the Chain of Custody. Therefore, the purpose of this paper is to identify and discuss the main issues involved in the complex process of IoT-based investigations,



particularly all legal, privacy and cloud security challenges. Furthermore, this work provides an overview of the past and current theoretical models in the digital forensics science. Special attention is paid to frameworks that aim to extract data in a privacy-preserving manner or secure the evidence integrity using decentralized blockchain-based solutions. In addition, the present paper addresses the ongoing Forensics-as-a-Service (FaaS) paradigm, as well as some promising cross-cutting data reduction and forensics intelligence techniques. Finally, several other research trends and open issues are presented, with emphasis on the need for...

链接: <https://ieeexplore.ieee.org/document/8950109>

10. 标题: Federated Learning: Challenges, Methods, and Future Directions

出处: IEEE Signal Processing Magazine

作者: Tian Li;Anit Kumar Sahu;Ameet Talwalkar;Virginia Smith

摘要: Federated learning involves training statistical models over remote devices or siloed data centers, such as mobile phones or hospitals, while keeping data localized. Training in heterogeneous and potentially massive networks introduces novel challenges that require a fundamental departure from standard approaches for large-scale machine learning, distributed optimization, and privacy-preserving data analysis. In this article, we discuss the unique characteristics and challenges of federated learning, provide a broad overview of current approaches, and outline several directions of future work that are relevant to a wide range of research communities.

链接: <https://ieeexplore.ieee.org/document/9084352>

11. 标题: A Continuous-Time Zoom ADC for Low-Power Audio Applications

出处: IEEE Journal of Solid-State Circuits

作者: Burak Gönen;Shoubhik Karmakar;Robert van Veldhoven;Kofi A. A. Makinwa

摘要: This article presents a continuous-time zoom analog to digital converter (ADC) for audio applications. It employs a high-speed asynchronous SAR ADC that dynamically updates the references of a continuous-time delta-sigma modulator (CTDSM). Compared to previous switched-capacitor (SC) zoom ADCs, its input impedance is essentially resistive, which relaxes the power dissipation of its reference and input buffers. Fabricated in a 160-nm CMOS process, the ADC occupies 0.27 mm<sup>2</sup> and achieves 108.1-dB peak SNR, 106.4-dB peak signal to noise and distortion ratio (SNDR), and 108.5-dB dynamic range in a 20-kHz bandwidth while consuming 618  $\mu$ W. This results in a Schreier figure of merit (FoM) of 183.6 dB.

链接: <https://ieeexplore.ieee.org/document/8945179>

12. 标题: ORB-SLAM: A Versatile and Accurate Monocular SLAM System

出处: IEEE Transactions on Robotics

作者: Raúl Mur-Artal;J. M. M. Montiel;Juan D. Tardós

摘要: This paper presents ORB-SLAM, a feature-based monocular simultaneous localization and mapping (SLAM) system that operates in real time, in small and large indoor and outdoor environments. The system is robust to severe motion clutter, allows wide baseline loop closing and relocalization, and includes full automatic initialization. Building on excellent algorithms of recent years, we designed from scratch a novel system that uses the same features for all SLAM tasks: tracking, mapping, relocalization, and loop closing. A survival of the fittest strategy that selects the

points and keyframes of the reconstruction leads to excellent robustness and generates a compact and trackable map that only grows if the scene content changes, allowing lifelong operation. We present an exhaustive evaluation in 27 sequences from the most popular datasets. ORB-SLAM achieves unprecedented performance with respect to other state-of-the-art monocular SLAM approaches. For the benefit of the community, we make the source code public.

链接: <https://ieeexplore.ieee.org/document/7219438>

13. 标题: RAISR: Rapid and Accurate Image Super Resolution

出处: IEEE Transactions on Computational Imaging

作者: Yaniv Romano;John Isidoro;Peyman Milanfar

摘要: Given an image, we wish to produce an image of larger size with significantly more pixels and higher image quality. This is generally known as the single image super-resolution problem. The idea is that with sufficient training data (corresponding pairs of low and high resolution images) we can learn set of filters (i.e., a mapping) that when applied to given image that is not in the training set, will produce a higher resolution version of it, where the learning is preferably low complexity. In our proposed approach, the run-time is more than one to two orders of magnitude faster than the best competing methods currently available, while producing results comparable or better than state-of-the-art. A closely related topic is image sharpening and contrast enhancement, i.e., improving the visual quality of a blurry image by amplifying the underlying details (a wide range of frequencies). Our approach additionally includes an extremely efficient way to produce an image that is significantly sharper than the input blurry one, without introducing artifacts, such as halos and noise amplification. We illustrate how this effective sharpening algorithm, in addition to being of independent interest, can be used as a preprocessing step to induce the learning of more effective upscaling filters with built-in sharpening and contrast enhancement effect.

链接: <https://ieeexplore.ieee.org/document/7744595>

14. 标题: Review of Deep Learning Algorithms and Architectures

出处: IEEE Access

作者: Ajay Shrestha;Ausif Mahmood

摘要: Deep learning (DL) is playing an increasingly important role in our lives. It has already made a huge impact in areas, such as cancer diagnosis, precision medicine, self-driving cars, predictive forecasting, and speech recognition. The painstakingly handcrafted feature extractors used in traditional learning, classification, and pattern recognition systems are not scalable for large-sized data sets. In many cases, depending on the problem complexity, DL can also overcome the limitations of earlier shallow networks that prevented efficient training and abstractions of hierarchical representations of multi-dimensional training data. Deep neural network (DNN) uses multiple (deep) layers of units with highly optimized algorithms and architectures. This paper reviews several optimization methods to improve the accuracy of the training and to reduce training time. We delve into the math behind training algorithms used in recent deep networks. We describe current shortcomings, enhancements, and implementations. The review also covers different types of deep architectures, such as deep convolution networks, deep residual networks, recurrent neural networks, reinforcement learning, variational autoencoders, and others.

链接: <https://ieeexplore.ieee.org/document/8694781>

15. 标题: Power of Deep Learning for Channel Estimation and Signal Detection in OFDM Systems

出处: IEEE Wireless Communications Letters

作者: Hao Ye;Geoffrey Ye Li;Biing-Hwang Juang

摘要: This letter presents our initial results in deep learning for channel estimation and signal detection in orthogonal frequency-division multiplexing (OFDM) systems. In this letter, we exploit deep learning to handle wireless OFDM channels in an end-to-end manner. Different from existing OFDM receivers that first estimate channel state information (CSI) explicitly and then detect/recover the transmitted symbols using the estimated CSI, the proposed deep learning-based approach estimates CSI implicitly and recovers the transmitted symbols directly. To address channel distortion, a deep learning model is first trained offline using the data generated from simulation based on channel statistics and then used for recovering the online transmitted data directly. From our simulation results, the deep learning based approach can address channel distortion and detect the transmitted symbols with performance comparable to the minimum mean-square error estimator. Furthermore, the deep learning-based approach is more robust than conventional methods when fewer training pilots are used, the cyclic prefix is omitted, and nonlinear clipping noise exists. In summary, deep learning is a promising tool for channel estimation and signal detection in wireless communications with complicated channel distortion and interference.

链接: <https://ieeexplore.ieee.org/document/8052521>

16. 标题: A Cascaded Multimodal Natural User Interface to Reduce Driver Distraction

出处: IEEE Access

作者: Myeongseop Kim;Eunjin Seong;Younkyung Jwa;Jieun Lee;Seungjun Kim

摘要: Natural user interfaces (NUI) have been used to reduce driver distraction while using in-vehicle infotainment systems (IVIS), and multimodal interfaces have been applied to compensate for the shortcomings of a single modality in NUIs. These multimodal NUIs have variable effects on different types of driver distraction and on different stages of drivers' secondary tasks. However, current studies provide a limited understanding of NUIs. The design of multimodal NUIs is typically based on evaluation of the strengths of a single modality. Furthermore, studies of multimodal NUIs are not based on equivalent comparison conditions. To address this gap, we compared five single modalities commonly used for NUIs (touch, mid-air gesture, speech, gaze, and physical buttons located in a steering wheel) during a lane change task (LCT) to provide a more holistic view of driver distraction. Our findings suggest that the best approach is a combined cascaded multimodal interface that accounts for the characteristics of a single modality. We compared several combinations of cascaded multimodalities by considering the characteristics of each modality in the sequential phase of the command input process. Our results show that the combinations speech + button, speech + touch, and gaze + button represent the best cascaded multimodal interfaces to reduce driver distraction for IVIS.

链接: <https://ieeexplore.ieee.org/document/9118888>

17. 标题: Big IoT Data Analytics: Architecture, Opportunities, and Open Research Challenges

出处: IEEE Access

作者: Mohsen Marjani;Fariza Nasaruddin;Abdullah Gani;Ahmad Karim;Ibrahim Abaker Targio Hashem;Aisha Siddiqa;Ibrar Yaqoob

摘要: Voluminous amounts of data have been produced, since the past decade as the miniaturization of Internet of things (IoT) devices increases. However, such data are not useful without analytic power. Numerous big data, IoT, and analytics solutions have enabled people to obtain valuable insight into large data generated by IoT devices. However, these solutions are still in their infancy, and the domain lacks a comprehensive survey. This paper investigates the state-of-the-art research efforts directed toward big IoT data analytics. The relationship between big data analytics and IoT is explained. Moreover, this paper adds value by proposing a new architecture for big IoT data analytics. Furthermore, big IoT data analytic types, methods, and technologies for big data mining are discussed. Numerous notable use cases are also presented. Several opportunities brought by data analytics in IoT paradigm are then discussed. Finally, open research challenges, such as privacy, big data mining, visualization, and integration, are presented as future research directions.

链接: <https://ieeexplore.ieee.org/document/7888916>

18. 标题: 6G and Beyond: The Future of Wireless Communications Systems

出处: IEEE Access

作者: Ian F. Akyildiz;Ahan Kak;Shuai Nie

摘要: 6G and beyond will fulfill the requirements of a fully connected world and provide ubiquitous wireless connectivity for all. Transformative solutions are expected to drive the surge for accommodating a rapidly growing number of intelligent devices and services. Major technological breakthroughs to achieve connectivity goals within 6G include: (i) a network operating at the THz band with much wider spectrum resources, (ii) intelligent communication environments that enable a wireless propagation environment with active signal transmission and reception, (iii) pervasive artificial intelligence, (iv) large-scale network automation, (v) an all-spectrum reconfigurable front-end for dynamic spectrum access, (vi) ambient backscatter communications for energy savings, (vii) the Internet of Space Things enabled by CubeSats and UAVs, and (viii) cell-free massive MIMO communication networks. In this roadmap paper, use cases for these enabling techniques as well as recent advancements on related topics are highlighted, and open problems with possible solutions are discussed, followed by a development timeline outlining the worldwide efforts in the realization of 6G. Going beyond 6G, promising early-stage technologies such as the Internet of NanoThings, the Internet of BioNanoThings, and quantum communications, which are expected to have a far-reaching impact on wireless communications, have also been discussed at length in this paper.

链接: <https://ieeexplore.ieee.org/document/9145564>

19. 标题: Speech Recognition Using Deep Neural Networks: A Systematic Review

出处: IEEE Access

作者: Ali Bou Nassif;Ismail Shahin;Imtihan Attili;Mohammad Azzeh;Khaled Shaalan

摘要: Over the past decades, a tremendous amount of research has been done on the use of machine learning for speech processing applications, especially speech recognition. However, in the past few years, research has focused on utilizing deep learning for speech-related applications. This new area of machine learning has yielded far better results when compared to others in a variety of applications including speech, and thus became a very attractive area of research. This paper provides a thorough examination of the different studies that have been conducted since 2006, when deep learning first arose as a new area of machine learning, for speech applications. A thorough statistical

analysis is provided in this review which was conducted by extracting specific information from 174 papers published between the years 2006 and 2018. The results provided in this paper shed light on the trends of research in this area as well as bring focus to new research topics.

链接: <https://ieeexplore.ieee.org/document/8632885>

20. 标题: Wireless Communications and Applications Above 100 GHz: Opportunities and Challenges for 6G and Beyond

出处: IEEE Access

作者: Theodore S. Rappaport; Yunchou Xing; Ojas Kanhere; Shihao Ju; Arjuna Madanayake; Soumyajit Mandal; Ahmed Alkhateeb; Georgios C. Trichopoulos

摘要: Frequencies from 100 GHz to 3 THz are promising bands for the next generation of wireless communication systems because of the wide swaths of unused and unexplored spectrum. These frequencies also offer the potential for revolutionary applications that will be made possible by new thinking, and advances in devices, circuits, software, signal processing, and systems. This paper describes many of the technical challenges and opportunities for wireless communication and sensing applications above 100 GHz, and presents a number of promising discoveries, novel approaches, and recent results that will aid in the development and implementation of the sixth generation (6G) of wireless networks, and beyond. This paper shows recent regulatory and standard body rulings that are anticipating wireless products and services above 100 GHz and illustrates the viability of wireless cognition, hyper-accurate position location, sensing, and imaging. This paper also presents approaches and results that show how long distance mobile communications will be supported to above 800 GHz since the antenna gains are able to overcome air-induced attenuation, and present methods that reduce the computational complexity and simplify the signal processing used in adaptive antenna arrays, by exploiting the Special Theory of Relativity to create a cone of silence in over-sampled antenna arrays that improve performance for digital phased array antennas. Also, new results that give insights into power efficient beam steering algorithms, and new propagation and partition loss models above 100 GHz are given, and promising imaging, array processing, and position location results are presented. The implementation of spatial consistency at THz frequencies, an important component of channel modeling that considers minute changes and correlations over space, is also discussed. This paper offers the first in-depth look at the vast applications of THz wireless products and applications and provides approaches ...

链接: <https://ieeexplore.ieee.org/document/8732419>

21. 标题: Image quality assessment: from error visibility to structural similarity

出处: IEEE Transactions on Image Processing

作者: Zhou Wang; A.C. Bovik; H.R. Sheikh; E.P. Simoncelli

摘要: Objective methods for assessing perceptual image quality traditionally attempted to quantify the visibility of errors (differences) between a distorted image and a reference image using a variety of known properties of the human visual system. Under the assumption that human visual perception is highly adapted for extracting structural information from a scene, we introduce an alternative complementary framework for quality assessment based on the degradation of structural information. As a specific example of this concept, we develop a structural similarity index and demonstrate its promise through a set of intuitive examples, as well as comparison to both subjective ratings and

state-of-the-art objective methods on a database of images compressed with JPEG and JPEG2000. A MATLAB implementation of the proposed algorithm is available online at <http://www.cns.nyu.edu/~spl sim/lcv/ssim/>.

链接: <https://ieeexplore.ieee.org/document/1284395>

22. 标题: Massive MIMO for next generation wireless systems

出处: IEEE Communications Magazine

作者: Erik G. Larsson;Ove Edfors;Fredrik Tufvesson;Thomas L. Marzetta

摘要: Multi-user MIMO offers big advantages over conventional point-to-point MIMO: it works with cheap single-antenna terminals, a rich scattering environment is not required, and resource allocation is simplified because every active terminal utilizes all of the time-frequency bins. However, multi-user MIMO, as originally envisioned, with roughly equal numbers of service antennas and terminals and frequency-division duplex operation, is not a scalable technology. Massive MIMO (also known as large-scale antenna systems, very large MIMO, hyper MIMO, full-dimension MIMO, and ARGOS) makes a clean break with current practice through the use of a large excess of service antennas over active terminals and time-division duplex operation. Extra antennas help by focusing energy into ever smaller regions of space to bring huge improvements in throughput and radiated energy efficiency. Other benefits of massive MIMO include extensive use of inexpensive low-power components, reduced latency, simplification of the MAC layer, and robustness against intentional jamming. The anticipated throughput depends on the propagation environment providing asymptotically orthogonal channels to the terminals, but so far experiments have not disclosed any limitations in this regard. While massive MIMO renders many traditional research problems irrelevant, it uncovers entirely new problems that urgently need attention: the challenge of making many low-cost low-precision components that work effectively together, acquisition and synchronization for newly joined terminals, the exploitation of extra degrees of freedom provided by the excess of service antennas, reducing internal power consumption to achieve total energy efficiency reductions, and finding new deployment scenarios. This article presents an overview of the massive MIMO concept and contemporary research on the topic.

链接: <https://ieeexplore.ieee.org/document/6736761>

23. 标题: Edge Computing: Vision and Challenges

出处: IEEE Internet of Things Journal

作者: Weisong Shi;Jie Cao;Quan Zhang;Youhuizi Li;Lanyu Xu

摘要: The proliferation of Internet of Things (IoT) and the success of rich cloud services have pushed the horizon of a new computing paradigm, edge computing, which calls for processing the data at the edge of the network. Edge computing has the potential to address the concerns of response time requirement, battery life constraint, bandwidth cost saving, as well as data safety and privacy. In this paper, we introduce the definition of edge computing, followed by several case studies, ranging from cloud offloading to smart home and city, as well as collaborative edge to materialize the concept of edge computing. Finally, we present several challenges and opportunities in the field of edge computing, and hope this paper will gain attention from the community and inspire more research in this direction.

链接: <https://ieeexplore.ieee.org/document/7488250>

24. 标题: Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks

出处: IEEE Transactions on Pattern Analysis and Machine Intelligence

作者: Shaoqing Ren;Kaiming He;Ross Girshick;Jian Sun

摘要: State-of-the-art object detection networks depend on region proposal algorithms to hypothesize object locations. Advances like SPPnet [1] and Fast R-CNN [2] have reduced the running time of these detection networks, exposing region proposal computation as a bottleneck. In this work, we introduce a Region Proposal Network(RPN) that shares full-image convolutional features with the detection network, thus enabling nearly cost-free region proposals. An RPN is a fully convolutional network that simultaneously predicts object bounds and objectness scores at each position. The RPN is trained end-to-end to generate high-quality region proposals, which are used by Fast R-CNN for detection. We further merge RPN and Fast R-CNN into a single network by sharing their convolutional features-using the recently popular terminology of neural networks with 'attention' mechanisms, the RPN component tells the unified network where to look. For the very deep VGG-16 model [3], our detection system has a frame rate of 5 fps (including all steps) on a GPU, while achieving state-of-the-art object detection accuracy on PASCAL VOC 2007, 2012, and MS COCO datasets with only 300 proposals per image. In ILSVRC and COCO 2015 competitions, Faster R-CNN and RPN are the foundations of the 1st-place winning entries in several tracks. Code has been made publicly available.

链接: <https://ieeexplore.ieee.org/document/7485869>

25. 标题: LSTM Fully Convolutional Networks for Time Series Classification

出处: IEEE Access

作者: Fazle Karim;Somshubra Majumdar;Houshang Darabi;Shun Chen

摘要: Fully convolutional neural networks (FCNs) have been shown to achieve the state-of-the-art performance on the task of classifying time series sequences. We propose the augmentation of fully convolutional networks with long short term memory recurrent neural network (LSTM RNN) sub-modules for time series classification. Our proposed models significantly enhance the performance of fully convolutional networks with a nominal increase in model size and require minimal preprocessing of the data set. The proposed long short term memory fully convolutional network (LSTM-FCN) achieves the state-of-the-art performance compared with others. We also explore the usage of attention mechanism to improve time series classification with the attention long short term memory fully convolutional network (ALSTM-FCN). The attention mechanism allows one to visualize the decision process of the LSTM cell. Furthermore, we propose refinement as a method to enhance the performance of trained models. An overall analysis of the performance of our model is provided and compared with other techniques.

链接: <https://ieeexplore.ieee.org/document/8141873>



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## *ESI HOT PAPERS*

### *(Computer Science)*

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(来源: <http://esi.incites.thomsonreuters.com>)

1、被引频次: 672

题目: MAFFT ONLINE SERVICE: MULTIPLE SEQUENCE ALIGNMENT, INTERACTIVE SEQUENCE CHOICE AND VISUALIZATION

作者: KATOH, K;ROZEWICKI, J;YAMADA, KD

出处: BRIEFINGS IN BIOINFORMATICS 20 (4): 1160-1166 JUL 2019

摘要: This article describes several features in the MAFFT online service for multiple sequence alignment (MSA). As a result of recent advances in sequencing technologies, huge numbers of biological sequences are available and the need for MSAs with large numbers of sequences is increasing. To extract biologically relevant information from such data, sophistication of algorithms is necessary but not sufficient. Intuitive and interactive tools for experimental biologists to semiautomatically handle large data are becoming important. We are working on development of MAFFT toward these two directions. Here, we explain (i) the Web interface for recently developed options for large data and (ii) interactive usage to refine sequence data sets and MSAs.

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2、被引频次: 254

题目: NEW COMPUTATIONAL APPROACH FOR EXERGY AND ENTROPY ANALYSIS OF NANOFLUID UNDER THE IMPACT OF LORENTZ FORCE THROUGH A POROUS MEDIA

作者: SHEIKHOESLAMI, M

出处: COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING 344: 319-333 FEB 1 2019

摘要: In current simulation, role of magnetic forces on ferrofluid second law treatment via innovative computational method has been reported. To estimate behavior of porous media, Non-Darcy model has been involved. Contours display the impact of magnetic force, Rayleigh and Darcy numbers. Iron oxide is considered as nanoparticles which are dispersed in to water. Results exhibit that exergy drop detracts with reduce of magnetic force. Bejan number detracts with decrease of permeability. As buoyancy forces improve, S-gen,S-th enhances. (C) 2018 Elsevier B.V. All rights reserved.

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3、被引频次：221

题目：NUMERICAL APPROACH FOR MHD AL<sub>2</sub>O<sub>3</sub>-WATER NANOFLUID TRANSPORTATION INSIDE A PERMEABLE MEDIUM USING INNOVATIVE COMPUTER METHOD

作者：SHEIKHOESLAMI, M

出处：COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING 344: 306-318 FEB 1 2019

摘要：Innovative numerical approach was employed to demonstrate nanofluid MHD flow through a porous enclosure. To model porous medium, Darcy law has been employed. Radiation impact was included in energy equation. The new method (CVFEM) has been employed due to complex shape of porous cavity. Aluminium oxide with different shapes was dispersed in to water. Viscosity of nanofluid changes with Brownian motion impacts. Roles of radiation, buoyancy and Hartmann number on treatment of alumina were displayed. Results prove that convection detracts with augment of magnetic forces. Radiation can reduce the temperature gradient. (C) 2018 Elsevier B.V. All rights reserved.

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4、被引频次：201

题目：RECENT TRENDS IN DEEP LEARNING BASED NATURAL LANGUAGE PROCESSING

作者：YOUNG, T;HAZARIKA, D;PORIA, S;CAMBRIA, E

出处：IEEE COMPUTATIONAL INTELLIGENCE MAGAZINE 13 (3): 55-75 AUG 2018

摘要：Deep learning methods employ multiple processing layers to learn hierarchical representations of data, and have produced state-of-the-art results in many domains. Recently, a variety of model designs and methods have blossomed in the context of natural language processing (NLP). In this paper, we review significant deep learning related models and methods that have been employed for numerous NLP tasks and provide a walk-through of their evolution. We also summarize, compare and contrast the various models and put forward a detailed understanding of the past, present and future of deep learning in NLP.

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5、被引频次：201

题目：DEEP CONVOLUTIONAL NEURAL NETWORK FOR THE AUTOMATED DETECTION AND DIAGNOSIS OF SEIZURE USING EEG SIGNALS

作者：ACHARYA, UR;OH, SL;HAGIWARA, Y;TAN, JH;ADELI, H

出处：COMPUTERS IN BIOLOGY AND MEDICINE 100: 270-278 SEP 1 2018

摘要：An encephalogram (EEG) is a commonly used ancillary test to aide in the diagnosis of epilepsy. The EEG signal contains information about the electrical activity of the brain. Traditionally, neurologists employ direct visual inspection to identify epileptiform abnormalities. This technique can be time-consuming, limited by technical artifact, provides variable results secondary to reader

expertise level, and is limited in identifying abnormalities. Therefore, it is essential to develop a computer-aided diagnosis (CAD) system to automatically distinguish the class of these EEG signals using machine learning techniques. This is the first study to employ the convolutional neural network (CNN) for analysis of EEG signals. In this work, a 13-layer deep convolutional neural network (CNN) algorithm is implemented to detect normal, preictal, and seizure classes. The proposed technique achieved an accuracy, specificity, and sensitivity of 88.67%, 90.00% and 95.00%, respectively.

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#### 6、被引频次: 183

题目: THE REDCAP CONSORTIUM: BUILDING AN INTERNATIONAL COMMUNITY OF SOFTWARE PLATFORM PARTNERS

作者: HARRIS, PA; TAYLOR, R; MINOR, BL; ELLIOTT, V; FERNANDEZ, M; ONEAL, L; MCLEOD, L; DELACQUA, G; DELACQUA, F; KIRBY, J; DUDA, SN

出处: JOURNAL OF BIOMEDICAL INFORMATICS 95: - JUL 2019

摘要: The Research Electronic Data Capture (REDCap) data management platform was developed in 2004 to address an institutional need at Vanderbilt University, then shared with a limited number of adopting sites beginning in 2006. Given bi-directional benefit in early sharing experiments, we created a broader consortium sharing and support model for any academic, non-profit, or government partner wishing to adopt the software. Our sharing framework and consortium-based support model have evolved over time along with the size of the consortium (currently more than 3200 REDCap partners across 128 countries). While the REDCap Consortium model represents only one example of how to build and disseminate a software platform, lessons learned from our approach may assist other research institutions seeking to build and disseminate innovative technologies.

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#### 7、被引频次: 147

题目: SECURITY AND PRIVACY IN DECENTRALIZED ENERGY TRADING THROUGH MULTI-SIGNATURES, BLOCKCHAIN AND ANONYMOUS MESSAGING STREAMS

作者: AITZHAN, NZ; SVETINOVIC, D

出处: IEEE TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING 15 (5): 840-852

SEP-OCT 2018

摘要: Smart grids equipped with bi-directional communication flow are expected to provide more sophisticated consumption monitoring and energy trading. However, the issues related to the security and privacy of consumption and trading data present serious challenges. In this paper we address the problem of providing transaction security in decentralized smart grid energy trading without reliance on trusted third parties. We have implemented a proof-of-concept for decentralized energy trading system using blockchain technology, multi-signatures, and anonymous encrypted messaging streams, enabling peers to anonymously negotiate energy prices and securely perform trading transactions. We conducted case studies to perform security analysis and performance evaluation within the context of the elicited security and privacy requirements.

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8、被引频次: 146

题目: DEEP LEARNING FOR HEALTHCARE: REVIEW, OPPORTUNITIES AND CHALLENGES

作者: MIOTTO, R;WANG, F;WANG, S;JIANG, XQ;DUDLEY, JT

出处: BRIEFINGS IN BIOINFORMATICS 19 (6): 1236-1246 NOV 2018

摘要: Gaining knowledge and actionable insights from complex, high-dimensional and heterogeneous biomedical data remains a key challenge in transforming health care. Various types of data have been emerging in modern biomedical research, including electronic health records, imaging, -omics, sensor data and text, which are complex, heterogeneous, poorly annotated and generally unstructured. Traditional data mining and statistical learning approaches typically need to first perform feature engineering to obtain effective and more robust features from those data, and then build prediction or clustering models on top of them. There are lots of challenges on both steps in a scenario of complicated data and lacking of sufficient domain knowledge. The latest advances in deep learning technologies provide new effective paradigms to obtain end-to-end learning models from complex data. In this article, we review the recent literature on applying deep learning technologies to advance the health care domain. Based on the analyzed work, we suggest that deep learning approaches could be the vehicle for translating big biomedical data into improved human health. However, we also note limitations and needs for improved methods development and applications, especially in terms of ease-of-understanding for domain experts and citizen scientists. We discuss such challenges and suggest developing holistic and meaningful interpretable architectures to bridge deep learning models and human interpretability.

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9、被引频次: 145

题目: GENE CO-EXPRESSION ANALYSIS FOR FUNCTIONAL CLASSIFICATION AND GENE-DISEASE PREDICTIONS

作者: VAN DAM, S;VOSA, U;VAN DER GRAAF, A;FRANKE, L;DE MAGALHAES, JP

出处: BRIEFINGS IN BIOINFORMATICS 19 (4): 575-592 JUL 2018

摘要: Gene co-expression networks can be used to associate genes of unknown function with biological processes, to prioritize candidate disease genes or to discern transcriptional regulatory programmes. With recent advances in transcriptomics and next-generation sequencing, co-expression networks constructed from RNA sequencing data also enable the inference of functions and disease associations for non-coding genes and splice variants. Although gene co-expression networks typically do not provide information about causality, emerging methods for differential co-expression analysis are enabling the identification of regulatory genes underlying various phenotypes. Here, we introduce and guide researchers through a (differential) co-expression analysis. We provide an overview of methods and tools used to create and analyse co-expression networks constructed from gene expression data, and we explain how these can be used to identify genes with a regulatory role in disease. Furthermore, we discuss the integration of other data types with co-expression networks and offer future perspectives of co-expression analysis.

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10、被引频次: 129

题目: DEEP LEARNING FOR HEALTHCARE APPLICATIONS BASED ON PHYSIOLOGICAL SIGNALS: A REVIEW

作者: FAUST, O;HAGIWARA, Y;HONG, TJ;LIH, OS;ACHARYA, UR

出处: COMPUTER METHODS AND PROGRAMS IN BIOMEDICINE 161: 1-13 JUL 2018

摘要: Background and objective: We have cast the net into the ocean of knowledge to retrieve the latest scientific research on deep learning methods for physiological signals. We found 53 research papers on this topic, published from 01.01.2008 to 31.12.2017. Methods: An initial bibliometric analysis shows that the reviewed papers focused on Electromyogram(EMG), Electroencephalogram(EEG), Electrocardiogram(ECG), and Electrooculogram(EOG). These four categories were used to structure the subsequent content review. Results: During the content review, we understood that deep learning performs better for big and varied datasets than classic analysis and machine classification methods. Deep learning algorithms try to develop the model by using all the available input. Conclusions: This review paper depicts the application of various deep learning algorithms used till recently, but in future it will be used for more healthcare areas to improve the quality of diagnosis. (C) 2018 Elsevier B.V. All rights reserved.

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11、被引频次: 122

题目: A NOVEL INTELLIGENT DIAGNOSIS METHOD USING OPTIMAL LS-SVM WITH IMPROVED PSO ALGORITHM

作者: DENG, W;YAO, R;ZHAO, HM;YANG, XH;LI, GY

出处: SOFT COMPUTING 23 (7): 2445-2462 SP. ISS. SI APR 2019

摘要: Aiming at the problem that the most existing fault diagnosis methods could not effectively recognize the early faults in the rotating machinery, the empirical mode decomposition, fuzzy information entropy, improved particle swarm optimization algorithm and least squares support vector machines are introduced into the fault diagnosis to propose a novel intelligent diagnosis method, which is applied to diagnose the faults of the motor bearing in this paper. In the proposed method, the vibration signal is decomposed into a set of intrinsic mode functions (IMFs) by using empirical mode decomposition method. The fuzzy information entropy values of IMFs are calculated to reveal the intrinsic characteristics of the vibration signal and considered as feature vectors. Then the diversity mutation strategy, neighborhood mutation strategy, learning factor strategy and inertia weight strategy for basic particle swarm optimization (PSO) algorithm are used to propose an improved PSO algorithm. The improved PSO algorithm is used to optimize the parameters of least squares support vector machines (LS-SVM) in order to construct an optimal LS-SVM classifier, which is used to classify the fault. Finally, the proposed fault diagnosis method is fully evaluated by experiments and comparative studies for motor bearing. The experiment results indicate that the fuzzy information entropy can accurately and more completely extract the characteristics of the vibration signal. The improved PSO algorithm can effectively improve the classification accuracy of LS-SVM, and the proposed fault diagnosis method outperforms the other mentioned methods in this paper and published in the literature. It provides a new method for fault diagnosis of rotating machinery.

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12、被引频次: 120

题目: INFRARED AND VISIBLE IMAGE FUSION METHODS AND APPLICATIONS: A SURVEY

作者: MA, JY;MA, Y;LI, C

出处: INFORMATION FUSION 45: 153-178 JAN 2019

摘要: Infrared images can distinguish targets from their backgrounds based on the radiation

difference, which works well in all-weather and all-day/night conditions. By contrast, visible images can provide texture details with high spatial resolution and definition in a manner consistent with the human visual system. Therefore, it is desirable to fuse these two types of images, which can combine the advantages of thermal radiation information in infrared images and detailed texture information in visible images. In this work, we comprehensively survey the existing methods and applications for the fusion of infrared and visible images. First, infrared and visible image fusion methods are reviewed in detail. Meanwhile, image registration, as a prerequisite of image fusion, is briefly introduced. Second, we provide an overview of the main applications of infrared and visible image fusion. Third, the evaluation metrics of fusion performance are discussed and summarized. Fourth, we select eighteen representative methods and nine assessment metrics to conduct qualitative and quantitative experiments, which can provide an objective performance reference for different fusion methods and thus support relative engineering with credible and solid evidence. Finally, we conclude with the current status of infrared and visible image fusion and deliver insightful discussions and prospects for future work. This survey can serve as a reference for researchers in infrared and visible image fusion and related fields.

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13、被引频次: 120

题目: HARRIS HAWKS OPTIMIZATION: ALGORITHM AND APPLICATIONS

作者: HEIDARI, AA;MIRJALILI, S;FARIS, H;ALJARAH, I;MAFARJA, M;CHEN, HL

出处: FUTURE GENERATION COMPUTER SYSTEMS-THE INTERNATIONAL JOURNAL OF ESCIENCE 97: 849-872 AUG 2019

摘要: In this paper, a novel population-based, nature-inspired optimization paradigm is proposed, which is called Harris Hawks Optimizer (HHO). The main inspiration of HHO is the cooperative behavior and chasing style of Harris' hawks in nature called surprise pounce. In this intelligent strategy, several hawks cooperatively pounce a prey from different directions in an attempt to surprise it. Harris hawks can reveal a variety of chasing patterns based on the dynamic nature of scenarios and escaping patterns of the prey. This work mathematically mimics such dynamic patterns and behaviors to develop an optimization algorithm. The effectiveness of the proposed HHO optimizer is checked, through a comparison with other nature-inspired techniques, on 29 benchmark problems and several real-world engineering problems. The statistical results and comparisons show that the HHO algorithm provides very promising and occasionally competitive results compared to well-established metaheuristic techniques. Source codes of HHO are publicly available at <http://www.alimirjalili.com/HHO.html> and <http://www.evo-ml.com/2019/03/02/hho>. (C) 2019 Elsevier B.V. All rights reserved.

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14、被引频次: 117

题目: A GENERAL REINFORCEMENT LEARNING ALGORITHM THAT MASTERS CHESS, SHOGI, AND GO THROUGH SELF-PLAY

作者: SILVER, D;HUBERT, T;SCHRITTWIESER, J;ANTONOGLOU, I;LAI, M;GUEZ, A;LANCTOT, M;SIFRE, L;KUMARAN, D;GRAEPEL, T;LILICRAP, T;SIMONYAN, K;HASSABIS, D

出处: SCIENCE 362 (6419): 1140-+ DEC 7 2018

摘要: The game of chess is the longest-studied domain in the history of artificial intelligence. The strongest programs are based on a combination of sophisticated search techniques, domain-specific adaptations, and handcrafted evaluation functions that have been refined by human experts over several decades. By contrast, the AlphaGo Zero program recently achieved superhuman performance in the game of Go by reinforcement learning from self-play. In this paper, we generalize this approach into a single AlphaZero algorithm that can achieve superhuman performance in many challenging games. Starting from random play and given no domain knowledge except the game rules, AlphaZero convincingly defeated a world champion program in the games of chess and shogi (Japanese chess), as well as Go.

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15、被引频次: 116

题目: MOTOR ANOMALY DETECTION FOR UNMANNED AERIAL VEHICLES USING REINFORCEMENT LEARNING

作者: LU, HM;LI, YJ;MU, SL;WANG, D;KIM, H;SERIKAWA, S

出处: IEEE INTERNET OF THINGS JOURNAL 5 (4): 2315-2322 SP. ISS. SI AUG 2018

摘要: Unmanned aerial vehicles (UAVs) are used in many fields including weather observation, farming, infrastructure inspection, and monitoring of disaster areas. However, the currently available UAVs are prone to crashing. The goal of this paper is the development of an anomaly detection system to prevent the motor of the drone from operating at abnormal temperatures. In this anomaly detection system, the temperature of the motor is recorded using DS18B20 sensors. Then, using reinforcement learning, the motor is judged to be operating abnormally by a Raspberry Pi processing unit. A specially built user interface allows the activity of the Raspberry Pi to be tracked on a Tablet for observation purposes. The proposed system provides the ability to land a drone when the motor temperature exceeds an automatically generated threshold. The experimental results confirm that the proposed system can safely control the drone using information obtained from temperature sensors attached to the motor.

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16、被引频次: 113

题目: AN EFFICIENT BINARY SALP SWARM ALGORITHM WITH CROSSOVER SCHEME FOR FEATURE SELECTION PROBLEMS

作者: FARIS, H;MAFARJA, MM;HEIDARI, AA;ALJARAH, I;AL-ZOUBI, AM;MIRJALILI, S;FUJITA, H

出处: KNOWLEDGE-BASED SYSTEMS 154: 43-67 AUG 15 2018

摘要: Searching for the (near) optimal subset of features is a challenging problem in the process of feature selection (FS). In the literature, Swarm Intelligence (SI) algorithms show superior performance in solving this problem. This motivated our attempts to test the performance of the newly proposed Salp Swarm Algorithm (SSA) in this area. As such, two new wrapper FS approaches that use SSA as the search strategy are proposed. In the first approach, eight transfer functions are employed to convert the continuous version of SSA to binary. In the second approach, the crossover operator is used in addition to the transfer functions to replace the average operator and enhance the exploratory behavior of the algorithm. The proposed approaches are benchmarked on 22 well-known UCI datasets and the results are compared with 5 FS methods: Binary Grey Wolf Optimizer (BGWO), Binary Gravitational Search Algorithms (BGSA), Binary Bat Algorithm (BBA), Binary Particle Swarm Optimization (BPSO), and Genetic Algorithm (GA). The paper also considers an extensive study of the parameter setting for the proposed technique. From the results, it is observed that the proposed approach significantly outperforms others on around 90% of the datasets.

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17、被引频次: 109

题目: A SYSTEMATIC STUDY OF THE CLASS IMBALANCE PROBLEM IN CONVOLUTIONAL NEURAL NETWORKS

作者: BUDA, M;MAKI, A;MAZUROWSKI, MA

出处: NEURAL NETWORKS 106: 249-259 OCT 2018

摘要: In this study, we systematically investigate the impact of class imbalance on classification performance of convolutional neural networks (CNNs) and compare frequently used methods to address the issue. Class imbalance is a common problem that has been comprehensively studied in classical machine learning, yet very limited systematic research is available in the context of deep learning. In our study, we use three benchmark datasets of increasing complexity, MNIST, CIFAR-10



and ImageNet, to investigate the effects of imbalance on classification and perform an extensive comparison of several methods to address the issue: oversampling, undersampling, two-phase training, and thresholding that compensates for prior class probabilities. Our main evaluation metric is area under the receiver operating characteristic curve (ROC AUC) adjusted to multi-class tasks since overall accuracy metric is associated with notable difficulties in the context of imbalanced data. Based on results from our experiments we conclude that (i) the effect of class imbalance on classification performance is detrimental; (ii) the method of addressing class imbalance that emerged as dominant in almost all analyzed scenarios was oversampling; (iii) oversampling should be applied to the level that completely eliminates the imbalance, whereas the optimal undersampling ratio depends on the extent of imbalance; (iv) as opposed to some classical machine learning models, oversampling does not cause overfitting of CNNs; (v) thresholding should be applied to compensate for prior class probabilities when overall number of properly classified cases is of interest. (c) 2018 Elsevier Ltd. All rights reserved.

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18、被引频次: 99

题目: PARTIAL MULTI-DIVIDING ONTOLOGY LEARNING ALGORITHM

作者: GAO, W;GUIRAO, JLG;BASAVANAGOUD, B;WU, JZ

出处: INFORMATION SCIENCES 467: 35-58 OCT 2018

摘要: As an effective data representation, storage, management, calculation and model for analysis, ontology has attracted more and more attention by researchers and it has been applied to various engineering disciplines. In the background of big data, the ontology is expected to increase the amount of data information and the structure of its corresponding ontology graph has become more important due to its complexity. It demands that the ontology algorithm must be more efficient than before. In a specific engineering application, the ontology algorithm is required to find in a quick way the semantic matching set of the concept and rank it back to the user according to their similarities. Therefore, to use learning tricks to get better ontology algorithms is an open problem nowadays. The aim of the present paper is to present a partial multi-dividing ontology algorithm with the aim of obtaining an efficient approach to optimize the partial multi-dividing ontology learning model. For doing it we state several theoretical results from a statistical learning theory perspective. Moreover, we present five experiments in different engineering fields to show the precision of our partial multi-dividing algorithm from angles of ontology, similarity measuring and ontology mapping building point of view. (C) 2018 Elsevier Inc. All rights reserved.

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19、被引频次：93

题目：CRYPTANALYZING AN IMAGE ENCRYPTION ALGORITHM BASED ON AUTOBLOCKING AND ELECTROCARDIOGRAPHY

作者：LI, CQ;LIN, DD;LU, JH;HAO, F

出处：IEEE MULTIMEDIA 25 (4): 46-56 OCT-DEC 2018

摘要：This paper performs a thorough security analysis of a chaotic image encryption algorithm based on autoblocking and electrocardiography from the view point of modern cryptography. The algorithm uses electrocardiography (ECG) signals to generate the initial key for a chaotic system and applies an autoblocking method to divide a plain image into blocks of certain sizes suitable for subsequent encryption. The designers claimed that the proposed algorithm is strong and flexible enough for practical applications. We find it is vulnerable to the known plaintext attack: based on one pair of a known plain-image and its corresponding cipher-image, an adversary is able to derive a mask image, which can be used as an equivalent secret key to successfully decrypt other cipher images encrypted under the same key with a non-negligible probability of 1/256. Using this as a typical counterexample, we summarize some security defects existing in many image encryption algorithms.

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20、被引频次：91

题目：BIOSEQ-ANALYSIS: A PLATFORM FOR DNA, RNA AND PROTEIN SEQUENCE ANALYSIS BASED ON MACHINE LEARNING APPROACHES

作者：LIU, B

出处：BRIEFINGS IN BIOINFORMATICS 20 (4): 1280-1294 JUL 2019

摘要：With the avalanche of biological sequences generated in the post-genomic age, one of the most challenging problems is how to computationally analyze their structures and functions. Machine learning techniques are playing key roles in this field. Typically, predictors based on machine learning techniques contain three main steps: feature extraction, predictor construction and performance evaluation. Although several Web servers and stand-alone tools have been developed to facilitate the biological sequence analysis, they only focus on individual step. In this regard, in this study a powerful Web server called BioSeq-Analysis (<http://bioinformatics.hitsz.edu.cn/BioSeq-Analysis/>) has been proposed to automatically complete the three main steps for constructing a predictor. The user only needs to upload the benchmark data set. BioSeq-Analysis can generate the optimized predictor based on the benchmark data set, and the performance measures can be reported as well. Furthermore, to maximize user's convenience, its stand-alone program was also released, which can be downloaded from

<http://bioinformatics.hitsz.edu.cn/BioSeq-Analysis/download/>, and can be directly run on Windows, Linux and UNIX. Applied to three sequence analysis tasks, experimental results showed that the predictors generated by BioSeq-Analysis even outperformed some state-of-the-art methods. It is anticipated that BioSeq-Analysis will become a useful tool for biological sequence analysis.

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21、被引频次: 89

题目: A PSO BASED ENERGY EFFICIENT COVERAGE CONTROL ALGORITHM FOR WIRELESS SENSOR NETWORKS

作者: WANG, J;JU, CW;GAO, Y;SANGAIAH, AK;KIM, GJ

出处: CMC-COMPUTERS MATERIALS & CONTINUA 56 (3): 433-446 SEP 2018

摘要: Wireless Sensor Networks (WSNs) are large-scale and high-density networks that typically have coverage area overlap. In addition, a random deployment of sensor nodes cannot fully guarantee coverage of the sensing area, which leads to coverage holes in WSNs. Thus, coverage control plays an important role in WSNs. To alleviate unnecessary energy wastage and improve network performance, we consider both energy efficiency and coverage rate for WSNs. In this paper, we present a novel coverage control algorithm based on Particle Swarm Optimization (PSO). Firstly, the sensor nodes are randomly deployed in a target area and remain static after deployment. Then, the whole network is partitioned into grids, and we calculate each grid's coverage rate and energy consumption. Finally, each sensor nodes' sensing radius is adjusted according to the coverage rate and energy consumption of each grid. Simulation results show that our algorithm can effectively improve coverage rate and reduce energy consumption.

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22、被引频次: 85

题目: THREE-WAY DECISION AND GRANULAR COMPUTING

作者: YAO, YY

出处: INTERNATIONAL JOURNAL OF APPROXIMATE REASONING 103: 107-123 DEC 2018

摘要: Based on results from cognitive science, this paper examines the two fields of three-way decision and granular computing, as well as their interplay. The ideas from one field shed new light on the other field. The integration of the two gives rise to three-way granular computing, that is, thinking, problem solving, and information processing in threes. We discuss a wide sense of three-way decision and propose a trisecting-acting outcome (TAO) model. We explain fundamental notions of granular computing based on the philosophy of three-way decision as thinking in threes. We discuss a model of three-way granular computing by making use of two particular types of granular structures represented, respectively, by three granules and three levels. We use examples

across different disciplines to demonstrate the values of the two types. Our investigation suggests that, in many situations, the power of granular computing is indeed the power of three-way decision, i.e., thinking in threes. (C) 2018 Elsevier Inc. All rights reserved.

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23、被引频次: 80

题目: A NOVEL MULTICHANNEL INTERNET OF THINGS BASED ON DYNAMIC SPECTRUM SHARING IN 5G COMMUNICATION

作者: LIU, X;JIA, M;ZHANG, XY;LU, WD

出处: IEEE INTERNET OF THINGS JOURNAL 6 (4): 5962-5970 AUG 2019

摘要: The shortage of spectrum resources has limited the development of Internet of Things (IoT). Fifth generation (5G) network can flexibly support a variety of devices and services, which makes it possible to combine 5G with IoT. In this paper, a novel multichannel IoT is proposed to dynamically share the spectrum with 5G communication, where an IoT node including transmitter and receiver is designed to perform 5G communication and IoT communication simultaneously. The subchannel sets allocated for 5G communication and IoT communication are defined by two complementary spectrum marker vectors, respectively. Two independent spectrum sequences are generated by calculating the inner products of spectrum marker vectors, pseudo-random phases and power scaling vectors. Two time-domain fundamental modulation waveforms generated by the inverse fast Fourier transform of the spectrum sequences are used to modulate 5G data and IoT data, respectively. The receiver can detect the data using the same spectrum marker vectors as the transmitter. The BER performances of the system using binary modulation and cyclic code shift keying modulation in the cases of spectrum marker error and multiple access are analyzed, respectively. A subchannel and power optimization unit is formulated as a joint optimization problem, which seeks to maximize the 5G throughput under the constraints of minimal IoT throughput, maximal power, and maximal interference. An alternative optimization problem is proposed to maximize the IoT throughput while guaranteeing the minimal 5G throughput. A joint optimization algorithm based on Lagrange dual decomposition is proposed to achieve the optimal solution. Simulation results indicate that the proposed IoT can improve the 5G throughput significantly while the IoT throughput is guaranteed.

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24、被引频次: 79

题目: IMPROVING METAHEURISTIC ALGORITHMS WITH INFORMATION FEEDBACK MODELS

作者: WANG, GG;TAN, Y

出处: IEEE TRANSACTIONS ON CYBERNETICS 49 (2): 542-555 FEB 2019



摘要: In most metaheuristic algorithms, the updating process fails to make use of information available from individuals in previous iterations. If this useful information could be exploited fully and used in the later optimization process, the quality of the succeeding solutions would be improved significantly. This paper presents our method for reusing the valuable information available from previous individuals to guide later search. In our approach, previous useful information was fed back to the updating process. We proposed six information feedback models. In these models, individuals from previous iterations were selected in either a fixed or random manner. Their useful information was incorporated into the updating process. Accordingly, an individual at the current iteration was updated based on the basic algorithm plus some selected previous individuals by using a simple fitness weighting method. By incorporating six different information feedback models into ten metaheuristic algorithms, this approach provided a number of variants of the basic algorithms. We demonstrated experimentally that the variants outperformed the basic algorithms significantly on 14 standard test functions and 10 CEC 2011 real world problems, thereby, establishing the value of the information feedback models.

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25、被引频次: 79

题目: A QoS-AWARE VIRTUAL MACHINE SCHEDULING METHOD FOR ENERGY CONSERVATION IN CLOUD-BASED CYBER-PHYSICAL SYSTEMS

作者: QI, LY;CHEN, Y;YUAN, Y;FU, SC;ZHANG, XY;XU, XL

出处: WORLD WIDE WEB-INTERNET AND WEB INFORMATION SYSTEMS 23 (2): 1275-1297 SP. ISS. SI MAR 2020

摘要: Nowadays, with the development of cyber-physical systems (CPS), there are an increasing amount of applications deployed in the CPS to connect cyber space with physical world better and closer than ever. Furthermore, the cloud-based CPS bring massive computing and storage resource for CPS, which enables a wide range of applications. Meanwhile, due to the explosive expansion of applications deployed on the CPS, the energy consumption of the cloud-based CPS has received wide concern. To improve the energy efficiency in the cloud environment, the virtualized technology is employed to manage the resources, and the applications are generally hosted by virtual machines (VMs). However, it remains challenging to meet the Quality-of-Service (QoS) requirements. In view of this challenge, a QoS-aware VM scheduling method for energy conservation, named QVMS, in cloud-based CPS is designed. Technically, our scheduling problem is formalized as a standard multi-objective problem first. Then, the Non-dominated Sorting Genetic Algorithm III (NSGA-III) is adopted to search the optimal VM migration solutions. Besides, SAW (Simple Additive Weighting) and MCDM (Multiple Criteria Decision Making) are employed to select the most optimal scheduling



strategy. Finally, simulations and experiments are conducted to verify the effectiveness of our proposed method.

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## *ESI HIGHLY CITED PAPERS*

### *(Computer Science)*

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(来源: <http://esi.incites.thomsonreuters.com>)

1、被引频次: 17815

题目: FITTING LINEAR MIXED-EFFECTS MODELS USING LME4

作者: BATES, D;MACHLER, M;BOLKER, BM;WALKER, SC

出处: JOURNAL OF STATISTICAL SOFTWARE 67 (1): 1-48 OCT 2015

摘要: Maximum likelihood or restricted maximum likelihood (REML) estimates of the parameters in linear mixed-effects models can be determined using the lmer function in the lme4 package for R. As for most model-fitting functions in R, the model is described in an lmer call by a formula, in this case including both fixed- and random-effects terms. The formula and data together determine a numerical representation of the model from which the profiled deviance or the profiled REML criterion can be evaluated as a function of some of the model parameters. The appropriate criterion is optimized, using one of the constrained optimization functions in R, to provide the parameter estimates. We describe the structure of the model, the steps in evaluating the profiled deviance or REML criterion, and the structure of classes or types that represents such a model. Sufficient detail is included to allow specialization of these structures by users who wish to write functions to fit specialized linear mixed models, such as models incorporating pedigrees or smoothing splines, that are not easily expressible in the formula language used by lmer.

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2、被引频次: 13719

题目: IMAGENET CLASSIFICATION WITH DEEP CONVOLUTIONAL NEURAL NETWORKS

作者: KRIZHEVSKY, A;SUTSKEVER, I;HINTON, GE

出处: COMMUNICATIONS OF THE ACM 60 (6): 84-90 JUN 2017

摘要: We trained a large, deep convolutional neural network to classify the 1.2 million high-resolution images in the ImageNet LSVRC-2010 contest into the 1000 different classes. On the test data, we achieved top-1 and top-5 error rates of 37.5% and 17.0%, respectively, which is considerably better than the previous state-of-the-art. The neural network, which has 60 million parameters and 650,000 neurons, consists of five convolutional layers, some of which are followed by max-pooling layers, and three fully connected layers with a final 1000-way softmax. To make training faster, we used non-saturating neurons and a very efficient GPU implementation of the convolution operation. To reduce overfitting in the fully connected layers we employed a recently

developed regularization method called dropout that proved to be very effective. We also entered a variant of this model in the ILSVRC-2012 competition and achieved a winning top-5 test error rate of 15.3%, compared to 26.2% achieved by the second-best entry.

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3、被引频次: 10400

题目: LIBSVM: A LIBRARY FOR SUPPORT VECTOR MACHINES

作者: CHANG, CC; LIN, CJ

出处: ACM TRANSACTIONS ON INTELLIGENT SYSTEMS AND TECHNOLOGY 2 (3): - SP. ISS. SI 2011

摘要: LIBSVM is a library for Support Vector Machines (SVMs). We have been actively developing this package since the year 2000. The goal is to help users to easily apply SVM to their applications. LIBSVM has gained wide popularity in machine learning and many other areas. In this article, we present all implementation details of LIBSVM. Issues such as solving SVM optimization problems theoretical convergence multiclass classification probability estimates and parameter selection are discussed in detail.

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4、被引频次: 7843

题目: SCIKIT-LEARN: MACHINE LEARNING IN PYTHON

作者: PEDREGOSA, F; VAROQUAUX, G; GRAMFORT, A; MICHEL, V; THIRION, B; GRISEL, O; BLONDEL, M; PRETTENHOFER, P; WEISS, R; DUBOURG, V; VANDERPLAS, J; PASSOS, A; COURNAPEAU, D; BRUCHER, M; PERROT, M; DUCHESNAY, E

出处: JOURNAL OF MACHINE LEARNING RESEARCH 12: 2825-2830 OCT 2011

摘要: Scikit-learn is a Python module integrating a wide range of state-of-the-art machine learning algorithms for medium-scale supervised and unsupervised problems. This package focuses on bringing machine learning to non-specialists using a general-purpose high-level language. Emphasis is put on ease of use, performance, documentation, and API consistency. It has minimal dependencies and is distributed under the simplified BSD license, encouraging its use in both academic and commercial settings. Source code, binaries, and documentation can be downloaded from <http://scikit-learn.sourceforge.net>.

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5、被引频次：5400

题目：RSEM: ACCURATE TRANSCRIPT QUANTIFICATION FROM RNA-SEQ DATA WITH OR WITHOUT A REFERENCE GENOME

作者：LI, B;DEWEY, CN

出处：BMC BIOINFORMATICS 12: - AUG 4 2011

摘要：Background: RNA-Seq is revolutionizing the way transcript abundances are measured. A key challenge in transcript quantification from RNA-Seq data is the handling of reads that map to multiple genes or isoforms. This issue is particularly important for quantification with de novo transcriptome assemblies in the absence of sequenced genomes, as it is difficult to determine which transcripts are isoforms of the same gene. A second significant issue is the design of RNA-Seq experiments, in terms of the number of reads, read length, and whether reads come from one or both ends of cDNA fragments. Results: We present RSEM, an user-friendly software package for quantifying gene and isoform abundances from single-end or paired-end RNA-Seq data. RSEM outputs abundance estimates, 95% credibility intervals, and visualization files and can also simulate RNA-Seq data. In contrast to other existing tools, the software does not require a reference genome. Thus, in combination with a de novo transcriptome assembler, RSEM enables accurate transcript quantification for species without sequenced genomes. On simulated and real data sets, RSEM has superior or comparable performance to quantification methods that rely on a reference genome. Taking advantage of RSEM's ability to effectively use ambiguously-mapping reads, we show that accurate gene-level abundance estimates are best obtained with large numbers of short single-end reads. On the other hand, estimates of the relative frequencies of isoforms within single genes may be improved through the use of paired-end reads, depending on the number of possible splice forms for each gene. Conclusions: RSEM is an accurate and user-friendly software tool for quantifying transcript abundances from RNA-Seq data. As it does not rely on the existence of a reference genome, it is particularly useful for quantification with de novo transcriptome assemblies. In addition, RSEM has enabled valuable guidance for cost-efficient design of quantification experiments with RNA-Seq, which is currently relatively expensive.

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6、被引频次：4326

题目：DROPOUT: A SIMPLE WAY TO PREVENT NEURAL NETWORKS FROM OVERFITTING

作者：SRIVASTAVA, N;HINTON, G;KRIZHEVSKY, A;SUTSKEVER, I;SALAKHUTDINOV, R

出处：JOURNAL OF MACHINE LEARNING RESEARCH 15: 1929-1958 JUN 2014

摘要: Deep neural nets with a large number of parameters are very powerful machine learning systems. However, overfitting is a serious problem in such networks. Large networks are also slow to use, making it difficult to deal with overfitting by combining the predictions of many different large neural nets at test time. Dropout is a technique for addressing this problem. The key idea is to randomly drop units (along with their connections) from the neural network during training. This prevents units from co-adapting too much. During training, dropout samples from an exponential number of different thinned networks. At test time, it is easy to approximate the effect of averaging the predictions of all these thinned networks by simply using a single unthinned network that has smaller weights. This significantly reduces overfitting and gives major improvements over other regularization methods. We show that dropout improves the performance of neural networks on supervised learning tasks in vision, speech recognition, document classification and computational biology, obtaining state-of-the-art results on many benchmark data sets.

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7、被引频次: 4305

题目: CONDUCTING META-ANALYSES IN R WITH THE METAFOR PACKAGE

作者: VIECHTBAUER, W

出处: JOURNAL OF STATISTICAL SOFTWARE 36 (3): 1-48 AUG 2010

摘要: The metafor package provides functions for conducting meta-analyses in R. The package includes functions for fitting the meta-analytic fixed- and random-effects models and allows for the inclusion of moderators variables (study-level covariates) in these models. Meta-regression analyses with continuous and categorical moderators can be conducted in this way. Functions for the Mantel-Haenszel and Peto's one-step method for meta-analyses of 2 x 2 table data are also available. Finally, the package provides various plot functions (for example, for forest, funnel, and radial plots) and functions for assessing the model fit, for obtaining case diagnostics, and for tests of publication bias.

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8、被引频次: 3746

题目: REGULARIZATION PATHS FOR GENERALIZED LINEAR MODELS VIA COORDINATE DESCENT

作者: FRIEDMAN, J; HASTIE, T; TIBSHIRANI, R

出处: JOURNAL OF STATISTICAL SOFTWARE 33 (1): 1-22 FEB 2010

摘要: We develop fast algorithms for estimation of generalized linear models with convex penalties. The models include linear regression, two-class logistic regression, and multinomial regression problems while the penalties include  $l(1)$  (the lasso),  $l(2)$  (ridge regression) and mixtures of the two (the elastic net). The algorithms use cyclical coordinate descent, computed along a regularization path. The methods can handle large problems and can also deal efficiently with sparse features. In comparative timings we find that the new algorithms are considerably faster than competing

methods.

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9、被引频次: 3121

题目: FAST AND ELEGANT NUMERICAL LINEAR ALGEBRA USING THE RCPPEIGEN PACKAGE

作者: BATES, D;EDDELBUETTEL, D

出处: JOURNAL OF STATISTICAL SOFTWARE 52 (5): 1-24 JAN 2013

摘要: The RcppEigen package provides access from R (R Core Team 2012a) to the Eigen (Guennebaud, Jacob, and others 2012) C++ template library for numerical linear algebra. Rcpp (Eddelbuettel and Francois 2011, 2012) classes and specializations of the C++ templated functions as and wrap from Rcpp provide the glue for passing objects from R to C++ and back. Several introductory examples are presented. This is followed by an in-depth discussion of various available approaches for solving least-squares problems, including rank-revealing methods, concluding with an empirical run-time comparison. Last but not least, sparse matrix methods are discussed.

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10、被引频次: 2987

题目: PROC: AN OPEN-SOURCE PACKAGE FOR R AND S PLUS TO ANALYZE AND COMPARE ROC CURVES

作者: ROBIN, X;TURCK, N;HAINARD, A;TIBERTI, N;LISACEK, F;SANCHEZ, JC;MULLER, M

出处: BMC BIOINFORMATICS 12: - MAR 17 2011

摘要: Background: Receiver operating characteristic (ROC) curves are useful tools to evaluate classifiers in biomedical and bioinformatics applications. However, conclusions are often reached through inconsistent use or insufficient statistical analysis. To support researchers in their ROC curves analysis we developed pROC, a package for R and S+ that contains a set of tools displaying, analyzing, smoothing and comparing ROC curves in a user-friendly, object-oriented and flexible interface. Results: With data previously imported into the R or S+ environment, the pROC package builds ROC curves and includes functions for computing confidence intervals, statistical tests for comparing total or partial area under the curve or the operating points of different classifiers, and methods for smoothing ROC curves. Intermediary and final results are visualised in user-friendly interfaces. A case study based on published clinical and biomarker data shows how to perform a typical ROC analysis with pROC. Conclusions: pROC is a package for R and S+ specifically dedicated to ROC analysis. It proposes multiple statistical tests to compare ROC curves, and in particular partial areas under the curve, allowing proper ROC interpretation. pROC is available in two versions: in the R programming language or with a graphical user interface in the S+ statistical software. It is accessible at <http://expasy.org/tools/pROC/> under the GNU General Public License. It is also distributed through the CRAN and CSAN public repositories, facilitating its installation.

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11、被引频次: 2984

题目: INTEGRATIVE GENOMICS VIEWER (IGV): HIGH-PERFORMANCE GENOMICS DATA VISUALIZATION AND EXPLORATION

作者: THORVALDSDOTTIR, H;ROBINSON, JT;MESIROV, JP

出处: BRIEFINGS IN BIOINFORMATICS 14 (2): 178-192 SP. ISS. SI MAR 2013

摘要: Data visualization is an essential component of genomic data analysis. However, the size and diversity of the data sets produced by today's sequencing and array-based profiling methods present major challenges to visualization tools. The Integrative Genomics Viewer (IGV) is a high-performance viewer that efficiently handles large heterogeneous data sets, while providing a smooth and intuitive user experience at all levels of genome resolution. A key characteristic of IGV is its focus on the integrative nature of genomic studies, with support for both array-based and next-generation sequencing data, and the integration of clinical and phenotypic data. Although IGV is often used to view genomic data from public sources, its primary emphasis is to support researchers who wish to visualize and explore their own data sets or those from colleagues. To that end, IGV supports flexible loading of local and remote data sets, and is optimized to provide high-performance data visualization and exploration on standard desktop systems. IGV is freely available for download from <http://www.broadinstitute.org/igv>, under a GNU LGPL open-source license.

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12、被引频次: 2775

题目: DEEP LEARNING IN NEURAL NETWORKS: AN OVERVIEW

作者: SCHMIDHUBER, J

出处: NEURAL NETWORKS 61: 85-117 JAN 2015

摘要: In recent years, deep artificial neural networks (including recurrent ones) have won numerous contests in pattern recognition and machine learning. This historical survey compactly summarizes relevant work, much of it from the previous millennium. Shallow and Deep Learners are distinguished by the depth of their credit assignment paths, which are chains of possibly learnable, causal links between actions and effects. I review deep supervised learning (also recapitulating the history of backpropagation), unsupervised learning, reinforcement learning & evolutionary computation, and indirect search for short programs encoding deep and large networks. (C) 2014 Published by Elsevier Ltd.

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13、被引频次: 2706

题目: MICE: MULTIVARIATE IMPUTATION BY CHAINED EQUATIONS IN R

作者: VAN BUUREN, S;GROOTHUIS-OUDSHOORN, K

出处: JOURNAL OF STATISTICAL SOFTWARE 45 (3): 1-67 DEC 2011

摘要: The R package mice imputes incomplete multivariate data by chained equations. The software mice 1.0 appeared in the year 2000 as an S-PLUS library, and in 2001 as an R package. mice 1.0 introduced predictor selection, passive imputation and automatic pooling. This article documents mice 2.9, which extends the functionality of mice 1.0 in several ways. In mice 2.9, the analysis of imputed data is made completely general, whereas the range of models under which pooling works is substantially extended. mice 2.9 adds new functionality for imputing multilevel data, automatic predictor selection, data handling, post-processing imputed values, specialized pooling routines, model selection tools, and diagnostic graphs. Imputation of categorical data is improved in order to bypass problems caused by perfect prediction. Special attention is paid to transformations, sum scores, indices and interactions using passive imputation, and to the proper setup of the predictor matrix. mice 2.9 can be downloaded from the Comprehensive R Archive Network. This article provides a hands-on, stepwise approach to solve applied incomplete data problems.

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14、被引频次: 2699

题目: THE NUMPY ARRAY: A STRUCTURE FOR EFFICIENT NUMERICAL COMPUTATION

作者: VAN DER WALT, S;COLBERT, SC;VAROQUAUX, G

出处: COMPUTING IN SCIENCE & ENGINEERING 13 (2): 22-30 MAR-APR 2011

摘要: In the Python world, NumPy arrays are the standard representation for numerical data and enable efficient implementation of numerical computations in a high-level language. As this effort shows, NumPy performance can be improved through three techniques: vectorizing calculations, avoiding copying data in memory, and minimizing operation counts.

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15、被引频次: 2666

题目: THE INTERNET OF THINGS: A SURVEY

作者: ATZORI, L;IERA, A;MORABITO, G

出处: COMPUTER NETWORKS 54 (15): 2787-2805 OCT 28 2010

摘要: This paper addresses the Internet of Things. Main enabling factor of this promising paradigm is the integration of several technologies and communications solutions. Identification and tracking technologies, wired and wireless sensor and actuator networks, enhanced communication protocols (shared with the Next Generation Internet), and distributed intelligence for smart objects are just the most relevant. As one can easily imagine, any serious contribution to the advance of the Internet of Things must necessarily be the result of synergetic activities conducted in different fields of

knowledge, such as telecommunications, informatics, electronics and social science. In such a complex scenario, this survey is directed to those who want to approach this complex discipline and contribute to its development. Different visions of this Internet of Things paradigm are reported and enabling technologies reviewed. What emerges is that still major issues shall be faced by the research community. The most relevant among them are addressed in details. (C) 2010 Elsevier B.V. All rights reserved.

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16、被引频次: 2486

题目: MIRT: A MULTIDIMENSIONAL ITEM RESPONSE THEORY PACKAGE FOR THE R ENVIRONMENT

作者: CHALMERS, RP

出处: JOURNAL OF STATISTICAL SOFTWARE 48 (6): 1-29 MAY 2012

摘要: Item response theory (IRT) is widely used in assessment and evaluation research to explain how participants respond to item level stimuli. Several R packages can be used to estimate the parameters in various IRT models, the most flexible being the ltm (Rizopoulos 2006), eRm (Mair and Hatzinger 2007), and MCMCpack (Martin, Quinn, and Park 2011) packages. However these packages have limitations in that ltm and eRm can only analyze unidimensional IRT models effectively and the exploratory multidimensional extensions available in MCMCpack requires prior understanding of Bayesian estimation convergence diagnostics and are computationally intensive. Most importantly, multidimensional confirmatory item factor analysis methods have not been implemented in any R package. The mirt package was created for estimating multidimensional item response theory parameters for exploratory and confirmatory models by using maximum-likelihood methods. The Gauss-Hermite quadrature method used in traditional EM estimation (e.g., Bock and Aitkin 1981) is presented for exploratory item response models as well as for confirmatory bifactor models (Gibbons and Hedeker 1992). Exploratory and confirmatory models are estimated by a stochastic algorithm described by Cai (2010a,b). Various program comparisons are presented and future directions for the package are discussed.

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17、被引频次: 2324

题目: PRODIGAL: PROKARYOTIC GENE RECOGNITION AND TRANSLATION INITIATION SITE IDENTIFICATION

作者: HYATT, D;CHEN, GL;LOCASCIO, PF;LAND, ML;LARIMER, FW;HAUSER, LJ

出处: BMC BIOINFORMATICS 11: - MAR 8 2010

摘要: Background: The quality of automated gene prediction in microbial organisms has improved steadily over the past decade, but there is still room for improvement. Increasing the number of correct identifications, both of genes and of the translation initiation sites for each gene, and reducing the overall number of false positives, are all desirable goals. Results: With our years of experience in manually curating genomes for the Joint Genome Institute, we developed a new gene prediction

algorithm called Prodigal (PROkaryotic DYnamic programming Gene-finding ALgorithm). With Prodigal, we focused specifically on the three goals of improved gene structure prediction, improved translation initiation site recognition, and reduced false positives. We compared the results of Prodigal to existing gene-finding methods to demonstrate that it met each of these objectives. Conclusion: We built a fast, lightweight, open source gene prediction program called Prodigal <http://compbio.ornl.gov/prodigal/>. Prodigal achieved good results compared to existing methods, and we believe it will be a valuable asset to automated microbial annotation pipelines.

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18、被引频次: 2240

题目: AVOGADRO: AN ADVANCED SEMANTIC CHEMICAL EDITOR, VISUALIZATION, AND ANALYSIS PLATFORM

作者: HANWELL, MD;CURTIS, DE;LONIE, DC;VANDERMEERSCH, T;ZUREK, E;HUTCHISON, GR

出处: JOURNAL OF CHEMINFORMATICS 4: - AUG 13 2012

摘要: Background: The Avogadro project has developed an advanced molecule editor and visualizer designed for cross-platform use in computational chemistry, molecular modeling, bioinformatics, materials science, and related areas. It offers flexible, high quality rendering, and a powerful plugin architecture. Typical uses include building molecular structures, formatting input files, and analyzing output of a wide variety of computational chemistry packages. By using the CML file format as its native document type, Avogadro seeks to enhance the semantic accessibility of chemical data types. Results: The work presented here details the Avogadro library, which is a framework providing a code library and application programming interface (API) with three-dimensional visualization capabilities; and has direct applications to research and education in the fields of chemistry, physics, materials science, and biology. The Avogadro application provides a rich graphical interface using dynamically loaded plugins through the library itself. The application and library can each be extended by implementing a plugin module in C++ or Python to explore different visualization techniques, build/manipulate molecular structures, and interact with other programs. We describe some example extensions, one which uses a genetic algorithm to find stable crystal structures, and one which interfaces with the PackMol program to create packed, solvated structures for molecular dynamics simulations. The 1.0 release series of Avogadro is the main focus of the results discussed here. Conclusions: Avogadro offers a semantic chemical builder and platform for visualization and analysis. For users, it offers an easy-to-use builder, integrated support for downloading from common databases such as PubChem and the Protein Data Bank, extracting chemical data from a wide variety of formats, including computational chemistry output, and native, semantic support for the CML file format. For developers, it can be easily extended via a powerful plugin mechanism to support new features in organic chemistry, inorganic complexes, drug design, materials, biomolecules, and simulations. Avogadro is freely available under an open-source license from <http://avogadro.openmolecules.net>.



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19、被引频次: 2178

题目: WHAT WILL 5G BE?

作者: ANDREWS, JG;BUZZI, S;CHOI, W;HANLY, SV;LOZANO, A;SOONG, ACK;ZHANG, JC

出处: IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS 32 (6): 1065-1082 JUN  
2014

摘要: What will 5G be? What it will not be is an incremental advance on 4G. The previous four generations of cellular technology have each been a major paradigm shift that has broken backward compatibility. Indeed, 5G will need to be a paradigm shift that includes very high carrier frequencies with massive bandwidths, extreme base station and device densities, and unprecedented numbers of antennas. However, unlike the previous four generations, it will also be highly integrative: tying any new 5G air interface and spectrum together with LTE and WiFi to provide universal high-rate coverage and a seamless user experience. To support this, the core network will also have to reach unprecedented levels of flexibility and intelligence, spectrum regulation will need to be rethought and improved, and energy and cost efficiencies will become even more critical considerations. This paper discusses all of these topics, identifying key challenges for future research and preliminary 5G standardization activities, while providing a comprehensive overview of the current literature, and in particular of the papers appearing in this special issue.

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20、被引频次: 2141

题目: MCMC METHODS FOR MULTI-RESPONSE GENERALIZED LINEAR MIXED MODELS:  
THE MCMCGLMM R PACKAGE

作者: HADFIELD, JD

出处: JOURNAL OF STATISTICAL SOFTWARE 33 (2): 1-22 FEB 2010

摘要: Generalized linear mixed models provide a flexible framework for modeling a range of data, although with non-Gaussian response variables the likelihood cannot be obtained in closed form. Markov chain Monte Carlo methods solve this problem by sampling from a series of simpler conditional distributions that can be evaluated. The R package M C M C g l m m implements such an algorithm for a range of model fitting problems. More than one response variable can be analyzed simultaneously, and these variables are allowed to follow Gaussian, Poisson, multi(bi) nominal,



exponential, zero-inflated and censored distributions. A range of variance structures are permitted for the random effects, including interactions with categorical or continuous variables (i.e., random regression), and more complicated variance structures that arise through shared ancestry, either through a pedigree or through a phylogeny. Missing values are permitted in the response variable(s) and data can be known up to some level of measurement error as in meta-analysis. All simulation is done in C/C++ using the CSparse library for sparse linear systems.

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21、被引频次：2058

题目：LEAST-SQUARES MEANS: THE R PACKAGE LSMEANS

作者：LENTH, RV

出处：JOURNAL OF STATISTICAL SOFTWARE 69 (1): 1-33 JAN 2016

摘要：Least-squares means are predictions from a linear model, or averages thereof. They are useful in the analysis of experimental data for summarizing the effects of factors, and for testing linear contrasts among predictions. The lsmeans package (Lenth 2016) provides a simple way of obtaining least-squares means and contrasts thereof. It supports many models fitted by R (R Core Team 2015) core packages (as well as a few key contributed ones) that fit linear or mixed models, and provides a simple way of extending it to cover more model classes.

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22、被引频次：2042

题目：OPEN BABEL: AN OPEN CHEMICAL TOOLBOX

作者：OBOYLE, NM;BANCK, M;JAMES, CA;MORLEY, C;VANDERMEERSCH, T;HUTCHISON, GR

出处：JOURNAL OF CHEMINFORMATICS 3: - OCT 7 2011

摘要：Background: A frequent problem in computational modeling is the interconversion of chemical structures between different formats. While standard interchange formats exist (for example, Chemical Markup Language) and de facto standards have arisen (for example, SMILES format), the need to interconvert formats is a continuing problem due to the multitude of different application areas for chemistry data, differences in the data stored by different formats (0D versus 3D, for example), and competition between software along with a lack of vendor-neutral formats. Results: We discuss, for the first time, Open Babel, an open-source chemical toolbox that speaks the many languages of chemical data. Open Babel version 2.3 interconverts over 110 formats. The need to represent such a wide variety of chemical and molecular data requires a library that implements a wide range of cheminformatics algorithms, from partial charge assignment and aromaticity detection, to bond order perception and canonicalization. We detail the implementation of Open Babel, describe key advances in the 2.3 release, and outline a variety of uses both in terms of software products and scientific research, including applications far beyond simple format interconversion. Conclusions: Open Babel presents a solution to the proliferation of multiple chemical file formats. In addition, it

provides a variety of useful utilities from conformer searching and 2D depiction, to filtering, batch conversion, and substructure and similarity searching. For developers, it can be used as a programming library to handle chemical data in areas such as organic chemistry, drug design, materials science, and computational chemistry. It is freely available under an open-source license from <http://openbabel.org>.

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23、被引频次: 2021

题目: LAVAAN: AN R PACKAGE FOR STRUCTURAL EQUATION MODELING

作者: ROSSEEL, Y

出处: JOURNAL OF STATISTICAL SOFTWARE 48 (2): 1-36 MAY 2012

摘要: Structural equation modeling (SEM) is a vast field and widely used by many applied researchers in the social and behavioral sciences. Over the years, many software packages for structural equation modeling have been developed, both free and commercial. However, perhaps the best state-of-the-art software packages in this field are still closed-source and/or commercial. The R package lavaan has been developed to provide applied researchers, teachers, and statisticians, a free, fully open-source, but commercial-quality package for latent variable modeling. This paper explains the aims behind the development of the package, gives an overview of its most important features, and provides some examples to illustrate how lavaan works in practice.

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24、被引频次: 1958

题目: INTERNET OF THINGS (IOT): A VISION, ARCHITECTURAL ELEMENTS, AND FUTURE DIRECTIONS

作者: GUBBI, J;BUYA, R;MARUSIC, S;PALANISWAMI, M

出处: FUTURE GENERATION COMPUTER SYSTEMS-THE INTERNATIONAL JOURNAL OF ESCIENCE 29 (7): 1645-1660 SEP 2013

摘要: Ubiquitous sensing enabled by Wireless Sensor Network (WSN) technologies cuts across many areas of modern day living. This offers the ability to measure, infer and understand environmental indicators, from delicate ecologies and natural resources to urban environments. The proliferation of these devices in a communicating actuating network creates the Internet of Things (IoT), wherein sensors and actuators blend seamlessly with the environment around us, and the information is shared across platforms in order to develop a common operating picture (COP). Fueled by the recent adaptation of a variety of enabling wireless technologies such as RFID tags and embedded sensor and actuator nodes, the IoT has stepped out of its infancy and is the next revolutionary technology in transforming the Internet into a fully integrated Future Internet. As we move from www (static pages web) to web2 (social networking web) to web3 (ubiquitous computing web), the need for data-on-demand using sophisticated intuitive queries increases significantly. This paper presents a Cloud centric vision for worldwide implementation of Internet of Things. The key

enabling technologies and application domains that are likely to drive IoT research in the near future are discussed. A Cloud implementation using Aneka, which is based on interaction of private and public Clouds is presented. We conclude our IoT vision by expanding on the need for convergence of WSN, the Internet and distributed computing directed at technological research community. (c) 2013 Elsevier B.V. All rights reserved.

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25、被引频次: 1870

题目: PRIMER-BLAST: A TOOL TO DESIGN TARGET-SPECIFIC PRIMERS FOR POLYMERASE CHAIN REACTION

作者: YE, J;COULOURIS, G;ZARETSKAYA, I;CUTCUTACHE, I;ROZEN, S;MADDEN, TL

出处: BMC BIOINFORMATICS 13: - JUN 18 2012

摘要: Background: Choosing appropriate primers is probably the single most important factor affecting the polymerase chain reaction (PCR). Specific amplification of the intended target requires that primers do not have matches to other targets in certain orientations and within certain distances that allow undesired amplification. The process of designing specific primers typically involves two stages. First, the primers flanking regions of interest are generated either manually or using software tools; then they are searched against an appropriate nucleotide sequence database using tools such as BLAST to examine the potential targets. However, the latter is not an easy process as one needs to examine many details between primers and targets, such as the number and the positions of matched bases, the primer orientations and distance between forward and reverse primers. The complexity of such analysis usually makes this a time-consuming and very difficult task for users, especially when the primers have a large number of hits. Furthermore, although the BLAST program has been widely used for primer target detection, it is in fact not an ideal tool for this purpose as BLAST is a local alignment algorithm and does not necessarily return complete match information over the entire primer range. Results: We present a new software tool called Primer-BLAST to alleviate the difficulty in designing target-specific primers. This tool combines BLAST with a global alignment algorithm to ensure a full primer-target alignment and is sensitive enough to detect targets that have a significant number of mismatches to primers. Primer-BLAST allows users to design new target-specific primers in one step as well as to check the specificity of pre-existing primers. Primer-BLAST also supports placing primers based on exon/intron locations and excluding single nucleotide polymorphism (SNP) sites in primers. Conclusions: We describe a robust and fully implemented general purpose primer design tool that designs target-specific PCR primers. Primer-BLAST offers flexible options to adjust the specificity threshold and other primer properties. This tool is publicly available at <http://www.ncbi.nlm.nih.gov/tools/primer-blast>.

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## AIAA、IAF 最新会议

### AIAA

(AIAA 来源: <http://www.aiaa.org/>)

1.会议名称: 2021 Integrated Communications Navigation and Surveillance Conference (ICNS)

会议时间: 20 APRIL - 22 APRIL 2021

会议地点: Herndon, Virginia

会议简介: The Integrated Communications Navigation and Surveillance (ICNS) Conference is the premier international aviation conference addressing technology and policy advances in CNS research, development and implementation programs, and policies related to CNS/ATM capabilities and applications.

链接:

[https://www.aiaa.org/events-learning/event/2021/04/20/default-calendar/2021-integrated-communications-navigation-and-surveillance-conference-\(icns\)](https://www.aiaa.org/events-learning/event/2021/04/20/default-calendar/2021-integrated-communications-navigation-and-surveillance-conference-(icns))

2.会议名称: 2021 AIAA Defense and Security Forum (AIAA DEFENSE Forum)

会议时间: 20 APRIL - 22 APRIL 2021

会议地点: Laurel, Maryland, USA

会议简介: The AIAA Defense and Security Forum (AIAA DEFENSE Forum) is a Secret/NOFORN event providing a venue for leaders from government, military, industry, and academia to advance and accelerate modernization, informed by Office of the Under Secretary of Defense for Research and Engineering's priorities.

链接:

[https://www.aiaa.org/events-learning/event/2021/04/20/default-calendar/2021-aiaa-defense-and-security-forum-\(aiaa-defense-forum\)](https://www.aiaa.org/events-learning/event/2021/04/20/default-calendar/2021-aiaa-defense-and-security-forum-(aiaa-defense-forum))

3.会议名称: 6th CEAS Conference on Guidance Navigation and Control (2021 EuroGNC)

会议时间: 5 MAY - 7 MAY 2021

会议地点: Berlin, Germany

会议简介: EuroGNC is the biannual conference for the international community of researchers and practitioners in the field of aerospace guidance, navigation and control. It provides a platform to discuss latest research results, perspectives on future developments and innovative applications relevant to aerospace and aeronautics.

链接:

[https://www.aiaa.org/events-learning/event/2021/05/05/default-calendar/6th-ceas-conference-on-guidance-navigation-and-control-\(2021-eurognc\)](https://www.aiaa.org/events-learning/event/2021/05/05/default-calendar/6th-ceas-conference-on-guidance-navigation-and-control-(2021-eurognc))



4.会议名称: 2021 Aerospace Spotlight Awards Gala

会议时间: 19 MAY 2021 1830 - 2130 (EASTERN DAYLIGHT TIME)

会议地点: Washington, D.C.

会议简介: Join us in celebration of recognizing the contributions of aerospace professionals and/or become a sponsor of the Aerospace Spotlight Awards Gala's Welcome and Congratulatory Receptions.

链接:

<https://www.aiaa.org/events-learning/event/2021/05/19/default-calendar/2021-aerospace-spotlight-awards-gala>

## IAF

(IAF 来源: <http://www.iafastro.org/>)

1.会议名称: COSPAR SYMPOSIUM 2021

会议时间: 28January-4 February 2021

会议地点: Sydney, Australia

会议简介: The leadership of COSPAR and the Local Organizing Committee for COSPAR 2020 in Sydney, Australia have concluded that with the worldwide pandemic and accompanying social and economic disruption, COSPAR 2020 must be postponed.

The new dates for the 43rd COSPAR Scientific Assembly will be 28 January – 4 February 2021 and hereafter will be referred to as COSPAR 2021.

The extensive planning and preparations for COSPAR 2020 are completely transferable to the new dates, by which time we anticipate that the thirst for knowledge and personal collaboration throughout the global space research community can and will be met with an extremely successful COSPAR Scientific Assembly in Australia.

We sincerely hope that the entire COSPAR community is able to remain healthy and that the extraordinary efforts underway to contain the coronavirus and preserve economic security are successful.

In the meantime, let's continue to work together virtually so that we ensure a Sydney summer in January 2021 will both brighten our outlook and continue our cause of promoting and facilitating international cooperation and advances in space research.

链接:

<https://www.iafastro.org/events/iaf-affiliated-events/cospar-symposium/cospar-symposium-2021.html>



## ACM 最新会议

来源：<http://www.acm.org/>

### 1. 会议名称：ICABE 2021

会议时间：March 26-28, 2021

会议地点：Shanghai, China

会议简介：The scope of the conference covers low-level technological issues, such as technology platforms, internet of things and web services, but also higher-level issues, such as business processes, business intelligence, value setting and business strategy. Furthermore, it covers different approaches to address these issues and different possible applications with their own specific needs and requirements on technology. These are all areas of theoretical and practical importance within the broad scope of e-Business, whose growing importance can be seen from the increasing interest of the IT research community. The conference will be held every year to make it an ideal platform for people to share views and experiences in E-Business and Applications and related areas. One Best Paper will be selected from each oral session. The Certificate will be awarded in the Banquet on March 27, 2021.

链接：<http://www.icabe.org/>

### 2.会议名称：MSIE 2021

会议时间：April 2-4, 2021

会议地点：Osaka, Japan

会议简介：2021 3rd International Conference on Management Science and Industrial Engineering will be held in Osaka, Japan during April 2-4, 2021. MSIE 2021 is one of the principal events for experts from academia, industry, utilities, researchers and scientists across the globe to exchange ideas and experiences on Management Science and Industrial Engineering. The primary goal of the conference is to exchange, share and distribute the latest research and theories from our international community. Prospective authors are invited to submit original research papers which have not been submitted or published by other conferences or journals.

MSIE 2019 was successfully held in Phuket, Thailand, MSIE 2020 was held online due to the COVID-19, and experts from all over the world attended this conference to share their reports during the past 2 years.

链接：<http://www.msie.org/>

### 3.会议名称：ICSCT 2021

会议时间：April 3-5, 2021

会议地点：University of Danang, Danang, Vietnam

会议简介：2021 10th International Conference on Software and Computing Technologies (ICSCT 2021) will be held in University of Danang, Danang, Vietnam, during April 3-5, 2021. It aims to provide a forum for researchers, practitioners, and professionals from both the industry and the academia to share their newest research findings and results.

ICSCT is co-organized by Journal of Software and Journal of Advances in Information Technology. The conference also serves to bring authors and editors of JSW and JAIT together to communicate face to face and discuss chances for possible cooperation and hot topics in the interdisciplinary areas. Welcome scholars and researchers working in the field of software and computing technologies from all over the world to attend the conference and share your experiences and lessons with other enthusiasts, and develop opportunities for cooperation.

链接: <http://www.icsct.org/>

4.会议名称: W4A'21

会议时间: April 19-20, 2021

会议地点: Ljubljana, Slovenia

会议简介: The conference focuses on all aspects of web accessibility. Areas of general interest include, but are not limited to the following: age, cognition, culture, education, emotions, dexterity, disability, diversity, health, hearing, income, infrastructure, language, learning, literacy, mobility, situation, society, and vision.

链接: <http://www.w4a.info/2021/>

5.会议名称: CLOSER 2021

会议时间: 28-30 APRIL, 2021

会议地点: ONLINE STREAMING

会议简介: The 11th International Conference on Cloud Computing and Services Science, CLOSER 2021, focuses on the highly important area of Cloud Computing, inspired by some latest advances that concern the infrastructure, operations, and available services through the global network. Further, the conference considers as essential the link to Services Science, acknowledging the service-orientation in most current IT-driven collaborations. The conference is nevertheless not about the union of these two (already broad) fields, but about Cloud Computing where we are also interested in how Services Science can provide theory, methods and techniques to design, analyze, manage, market and study various aspects of Cloud Computing.

链接: <http://closer.scitevents.org/>

6.会议名称: IWSG 2021

会议时间: April 23-25, 2021

会议地点: Chongqing, China

会议简介: 2021 2nd International Workshop on Smart Grid (IWSG 2021) will be held on April 23-25, 2021 in Chongqing, China. The purpose of the International Workshop on Smart Grid (IWSG 2021) is to bring together researchers, engineers, manufacturers, practitioners and customers from all over the world to share and discuss advances and developments in Smart Grids research and applications.

第二届智能电网论坛将于 2021 年 4 月 23-25 日在中国重庆召开。重庆市, 简称巴、渝, 别称山城、雾都、桥都, 中华人民共和国直辖市、首批国家中心城市、超大城市。重庆是长江上游地区经济中心。重庆是中国著名的历史文化名城, 具有 3000 多年的悠久历史和光荣的革命传统, 以重庆为中心的古巴渝地区是巴渝文化的发祥地, 这片土地孕育了重庆悠久的历史。

链接: <http://www.iwsg.org/>

7.会议名称: CEEPE 2021

会议时间: April 23-25, 2021

会议地点: Chongqing, China

会议简介: 2021 the 4th International Conference on Energy, Electrical and Power Engineering (CEEPE 2021) will be held in Chongqing, China during April 23-25, 2021. Previous CEEPE conferences were held at Seoul National University, South Korea (2018) and the University of California, Berkley, USA (2019). CEEPE2021 is co-sponsored by Chongqing University, China, South Asia Institute of Science and Engineering (SAISE) and IEEE; Organized by School of Electrical Engineering, Chongqing University, China.

The aim of CEEPE 2021 is to present the latest research and results of scientists related to Energy, Electrical and Power Engineering topics. This conference provides opportunities for the different areas delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. We hope that the conference results constituted significant contribution to the knowledge in these up to date scientific field.

由重庆大学,南亚科学与工程协会(SAISE)和 IEEE 联合主办,重庆大学电气工程学院承办的第四届能源,电气和电力工程国际会议(CEEPE 2021),将于2021年4月23-25日在中国重庆召开。

CEEPE2019 已在美国加州大学伯克利分校成功召开,CEEPE2018 在首尔大学成功召开。2020年原定于重庆举办,由于疫情影响,会议最终通过线上视频会议的新媒体方式成功举行,参会者们对会议的热情不减,会议效果依然良好。会议旨在促进能源,电气和电力工程等领域的学术交流与合作,热忱欢迎从事相关技术研究的专家、学者和专业技术人员踊跃投稿并参加大会。

链接: <http://www.ceepe.net/>

8.会议名称: EuroSys 2021

会议时间: April 26th—29th, 2021

会议地点: Edinburgh, Scotland, UK

会议简介: EuroSys 2021 will be held virtually from 26th (Monday) —29th (Thursday) April, 2021. in Edinburgh, UK.

EuroSys conference is a premier forum for discussing various issues of systems software research and development, including implications related to hardware and applications. The conference brings together professionals from academia and industry. It has a strong focus on systems research and development: operating systems, database systems, real-time systems, networked systems, storage systems, middleware, distributed, parallel, or embedded computing systems.

The 16th edition of EuroSys will follow the pattern established by the previous EuroSys conferences, by seeking papers on all aspects of computer systems. EuroSys 2021 will also include a number of workshops to allow junior and senior members of the systems community to explore leading-edge topics and ideas before they are presented at a conference.

链接: <https://2021.eurosys.org/>

9.会议名称: ACM MMSys 2021

会议时间: May 25-28, 2021

会议地点: Istanbul

会议简介: The ACM Multimedia Systems Conference (MMSys) provides a forum for researchers to





present and share their latest research findings in multimedia systems. While research about specific aspects of multimedia systems are regularly published in the various proceedings and transactions of the networking, operating systems, real-time systems, databases, mobile computing, distributed systems, computer vision, and middleware communities, MMSys aims to cut across these domains in the context of multimedia data types. This provides a unique opportunity to investigate the intersections and the interplay of the various approaches and solutions developed across these domains to deal with multimedia data types.

链接: <https://2021.acmmmsys.org/>

10.会议名称: ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS)

会议时间: May 31-June 2, 2021

会议地点: Suffolk, Virginia, USA

会议简介: The 2021 ACM SIGSIM PADS will take place at Old Dominion University VMASC on May 31-June 2, 2021 in Suffolk, Virginia, U.S.A.

The annual PADS conference has a long history dating back to 1985. The conference was formerly known under the name Principles of Advanced and Distributed Simulation, and before that simply Parallel and Distributed Simulation. Over the years PADS has broadened its scope beyond its origins in parallel and distributed simulation and now encompasses virtually all research that lies at the intersection of the computer science and the modeling and simulation fields. Specifically, many research topics not related to parallel or distributed model execution are now included.

SIGSIM PADS provides a unique forum for reporting and discussing research results and important topics of interest to the M&S community. SIGSIM PADS is the flagship conference of ACM's Special Interest Group on Simulation and Modeling (SIGSIM) and is fully sponsored by that organization.

链接: <http://www.acm-sigsim-pads.org/>



## ***IQPC 最新国防会议(Defence)***

IQPC 来源: <http://www.iqpc.com/>

1. 会议名称: Maritime ISR Global

会议时间: 10 - 11 March, 2021

会议地点: London

会议简介: Maritime ISR Global 2020 will welcome 150 senior leaders from the UK, Australia, Sweden, Germany, NATO and many others to set a roadmap for delivering persistent maritime ISR. With Europe's defence narrative focused on the threat of peer conflict in the land environment, the Black Sea serves as a reminder that the ability to operate at sea is just as intrinsic to NATO's strategic priorities. As the uptick in non-NATO activity continues, its waters have become an important case study for delivering a global joint ISR capability – one that can overcome an increased operational tempo to sustain a high-level of decision support to the war fighter.

With the outcome of future combat operations dependent on integration – cross-platform and across domain – the first of the three days will ask how we can successfully embed the innovation that meets that need. The two main days will look at delivering integration in practice, and will ask how space, air, surface and sub-surface nodes can overcome the tyranny of scale to maximise MDA and improve data relay, delivering a multi-domain intelligence function which can incorporate cyber and mitigate the full-spectrum of hybrid threats to maintain information advantage.

For the first time in 2020, the conference includes a Focus Day on Anti-Submarine Warfare, recognising the revived importance of this mission set and the role of ASW assets in supporting a full-spectrum approach to MDA.

链接: [https://www.defenceiq.com/events-maritimerecon/?utm\\_medium=portal&mac=IQPCCORP](https://www.defenceiq.com/events-maritimerecon/?utm_medium=portal&mac=IQPCCORP)

2.会议名称: Military Flight Training 2021

会议时间: 23 - 25 March, 2021

会议地点: Hilton Syon Park, London, United Kingdom

会议简介: Concurrent with today's operational context, Military Flight Training 2020 will discuss key challenge areas such as: training for contested and degraded environments, delivering LVC in mixed inventories of new and legacy platforms, solving red air deficiency, LVC interoperability, rotary-wing training, recruitment & retention, operational conversion training and crew resource management, integrated synthetic/virtual training capabilities, and effective threat emulations.

Attracting over 250 military and industry attendees from over 40 nations, Military Flight Training 2020 arrives at a time where guaranteeing air superiority and strike capability has never been tougher.

链接:

[https://www.defenceiq.com/events-militaryflighttraining/?utm\\_medium=portal&mac=IQPCCORP](https://www.defenceiq.com/events-militaryflighttraining/?utm_medium=portal&mac=IQPCCORP)

3.会议名称: Air Integration Summit

会议时间: 20 - 22 April, 2021

会议地点: United Kingdom

会议简介: Due to the ongoing situation with COVID-19, we have taken the decision to postpone the Air Integration Summit 2020.

The event is postponed until 2021, and we will update you again when the future dates are finalised. We apologise for any inconvenience caused however we will be back in 2021 to deliver a quality event and thank you for your support.

Previously the Close Air Support conference, Air Integration Summit 2021 will widen the scope of discussions and build meaningful consensus around solving shared challenges on integration of the Air domain within Joint combat operations. Within this single domain, multi-user context the re-formatted conference will discuss the most challenging issues at the 'business end' of air power and discuss the means by which attack capability can be delivered rapidly from the air in the most precise way.

Fresh light attack programmes, the growing focus on precise Joint effects and a NATO focus on greater interoperability for contested and multi-domain environments suggests an urgent need for development. As such we are pleased to host this summit to give leaders at the joint and coalition levels an opportunity to talk through their most critical challenges and share some insight into the design of their attack mission set as well as participate in the discussions that will allow them to seize and exploit the initiative.

链接:

[https://www.defenceiq.com/events-airintegrationsummit/?utm\\_medium=portal&mac=IQPCCORP](https://www.defenceiq.com/events-airintegrationsummit/?utm_medium=portal&mac=IQPCCORP)

4.会议名称: Deployed Medical & Healthcare Delivery

会议时间: 27 - 28 April, 2021

会议地点: London

会议简介: Organised with the support of Defence Medical Services, UK MoD, Deployed Medical and Healthcare Delivery is the flagship opportunity for clinicians, organisational thinkers and capability planners to drive clinical delivery for the battlefield of the future.

As doctrine adapts to meet the peer threat, the military medical community must improve capability across the Operational Patient Care Pathway – from point of injury through to definitive care. DMHD will be the only conference to look across that pathway, with a three day programme that asks how clinical care can be delivered in accordance with accepted clinical timelines, on a less dense battlefield and with insecure lines of communication.

In 2020, the conference moves to its natural next phase, seeking to identify the technology which will support that change in practice, and to accelerate the application of innovation across the Operational Patient Care Pathway. Our starting premise remains the same: individual advances in clinical care can deliver enhanced outcomes at specific points along that pathway, but their effects will not truly be felt unless other elements in the pathway can keep pace. The conference's mission is to support that overall improvement.

链接:

[https://www.defenceiq.com/events-deployedmedicalforum/?utm\\_medium=portal&mac=IQPCCORP](https://www.defenceiq.com/events-deployedmedicalforum/?utm_medium=portal&mac=IQPCCORP)



5.会议名称: Additive Manufacturing for Aerospace & Space USA

会议时间: May 04 - 06, 2021

会议地点: Sheraton Lake Buena Vista | Orlando, Florida, United States

会议简介: With great pleasure, we welcome you to the inaugural Additive Manufacturing for Aerospace & Space USA conference. This is the first time in its 7-year history that the Europe's premier AM for Aerospace and Space conference has made the trip across the Atlantic, and we could not be more excited.

Due to popular demand from our community's AM users, R&D experts and industry partners, the event will provide a unique platform for the high-level discussion of additive technologies and a chance to tackle the U.S. specific obstacles, including the roadblocks of industrial digitisation within the U.S. aerospace industry.

Through a series of case study led presentations, interactive discussions and activities, the conference will provide a unique forum for both users and solution providers to collaborate, share knowledge and build networks.

Launched with the support of Siemens & Materials Solutions, as they open their new Innovation Center in Orlando, attendees will also have the chance to visit the facility, which offers a unique pairing of design with manufacturing, implementing robotics, rapid prototyping, scanning, digital tools and on-site metal additive manufacturing.

We very much hope you can join us in August to ensure you can exploit the performance gains and economic returns that AM offers.

链接:

[https://www.defenceiq.com/events-additivemanufacturingusa/?utm\\_medium=portal&utm\\_source=IOPCCO](https://www.defenceiq.com/events-additivemanufacturingusa/?utm_medium=portal&utm_source=IOPCCO)  
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