

《人工智能在医药健康领域战略研究（2035）》参考

2020年第20期（总第33期）

中国工程科技知识中心医药卫生专业分中心
中国医学科学院医学信息研究所 2020年10月20日

[动态信息]

1. 医疗保健中的人工智能和物联网如何帮助老年痴呆患者

【RFID 世界网】随着年龄的增长，老年人会在肢体行动力、听力、说话和视力等方面都有相应的减弱。老年痴呆症是出现几种精神状态和功能状态上的障碍，比如记忆力衰退，思考方式的改变等。现在人工智能在医疗科技上广泛应用，物联网和人工智能的结合是否可以有效改善老年痴呆的症状？

链接：http://news.rfidworld.com.cn/2020_10/0b536043e9443353.html

2. 国家卫健委：探索医疗健康区块链技术应用标准化建设！

【健康界】据国家卫生健康委官网10月10日消息，为加强全民健康信息标准化体系建设，更好地发挥标准的规范、引领和支撑作用，推进互联网、大数据、人工智能、区块链、5G等新兴技术与医疗健康行业的创新融合发展，国家卫生健康委研究制定了《关于加强全民健康信息标准化体系建设的意见》（以下简称《意见》）。《意见》提出，推动医疗健康人工智能应用标准化建设，鼓励医疗健康5G技术应用标准化建设，探索医疗健康区块链技术应用标准化建设。

链接：<https://www.cn-healthcare.com/articlewm/20201014/content-1152967.html>

3. 《Nature》子刊收录宣武医院 CTA 研究，AI 重塑临床流程

【动脉网】近日 Nature 子刊 Nature Communications 在线刊发了题为 Rapid

vessel segmentation and reconstruction of head and neck CTA using 3D convolutional neural network 的科研论文 IF=12.121 该论文由首都医科大学宣武医院卢洁教授团队与数坤北京网络科技有限公司共同研究发布论文第一作者为傅璠博士通讯作者为卢洁教授。

链接: <https://baijiahao.baidu.com/s?id=1680491071557982870&wfr=spider&for=pc>

4. 探索人工智能创新应用 青岛要在 5 大领域为 AI 赋能制造业探路

【潇湘晨报】为加快人工智能创新应用先导区建设，推动新一代人工智能和实体经济深度融合发展，《青岛市人工智能创新应用先导区建设实施方案》近日印发。青岛将以人工智能与制造业深度融合为突破口，探索人工智能创新应用。尤其要在工业互联网、智能轨道交通、智能家居、超高清视频、智慧医疗等优势特色领域“趟出一条路子”，形成人工智能产业发展“青岛模式”。

链接: <https://baijiahao.baidu.com/s?id=1680475315688408419&wfr=spider&for=pc>

5. 南开大学举办“人工智能+机器人”高端论坛

【教育信息速报】10月10日，由人工智能学院、计算机学院、网络空间安全学院、电子信息与光学工程学院、软件学院联合主办的“人工智能+机器人”高端论坛在南开大学津南新校区举行。

链接: <https://baijiahao.baidu.com/s?id=1680421287986956914&wfr=spider&for=pc>

6. Tufts Taps Olive’ s AI Centers to Expand COVID-19 Testing

【healthitanalytics】Tufts Medical Center recently announced a partnership with startup healthcare company, Olive, to leverage artificial intelligence to streamline COVID-19 testing operations.

链接: <https://hitinfrastructure.com/news/tufts-taps-olives-ai-centers-to-expand-covid-19-testing>

7. Artificial intelligence-based tool can predict COVID-19 outbreaks at football events

【news-medical】Recent outbreaks of COVID-19 have been detected following football events in the United States, and games have the potential to become

"superspreader" events. Because the National Football League (NFL) and National Collegiate Athletic Association (NCAA) made the decision to play their games amidst the ongoing COVID-19 pandemic, researchers at Massachusetts General Hospital (MGH), Harvard Medical School, Georgia Tech and Boston Medical Center have extended their artificial intelligence-based COVID-19 Outbreak Detection Tool to incorporate NFL and NCAA football games. The model can help public officials and team owners in their decision-making regarding in-person attendance.

链接:

<https://www.news-medical.net/news/20201013/COVID-19-outbreaks-in-US-counties-that-host-pr-o-football-events.aspx>

8. Expanding Access to Mental Healthcare with Artificial Intelligence

【hitinfrastructure】 Across the country today, it is widely acknowledged that access to mental healthcare is just as important as clinical care when it comes to overall wellness.

链接:

<https://healthitanalytics.com/news/expanding-access-to-mental-healthcare-with-artificial-intelligence>

9. Researchers develop new model to observe self-optimization phenomenon in neuronal networks

【news-medical】 Researchers at the Cyber-Physical Systems Group at the USC Viterbi School of Engineering, in conjunction with the University of Illinois at Urbana-Champaign, have developed a new model of how information deep in the brain could flow from one network to another and how these neuronal network clusters self-optimize over time.

链接:

<https://www.news-medical.net/news/20201013/Researchers-develop-new-model-to-observe-self-optimization-phenomenon-in-neuronal-networks.aspx>

10. Artificial Intelligence Platform Enables Data Analytics for Research

【healthitanalytics】 An artificial intelligence-driven program will help facilitate big data analytics research among scientists without specialized expertise, according to a study published in Cancer Cell.

链接:

<https://healthitanalytics.com/news/artificial-intelligence-platform-enables-data-analytics-for-research>

[文献速递]

1. 深度学习算法在面向行为分析的抑郁症辅助诊断中的研究进展

作者: 马思梦

文献来源: *中华精神科杂志*

摘要: 近十年来, 人工智能技术快速发展并逐渐由学术界走向产业界, 其在医疗领域的应用也逐渐深入。受技术和伦理的局限, 人工智能在医疗领域更多处于辅助决策的地位。抑郁症作为一种常见的精神障碍, 其发病率在全球日益增长, 如何利用以深度学习为代表的人工智能技术手段实现对抑郁症的筛查和诊断, 促进抑郁症早发现和及时治疗, 具有十分重要的意义。我们对近几年以人工智能为手段的抑郁症辅助诊断技术进行了文献调研和总结, 主要从人脸表情、语音语调、文本语义、姿态行为及多模态数据融合 5 个方面入手, 介绍人工智能在面向患者日常行为分析的抑郁症辅助诊断方面的研究进展。

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66135

2. 基于 3D 打印技术骨科康复学的发展前景

作者: 彭坤

文献来源: *中国组织工程研究*

摘要: 背景:3D 精准打印在骨科康复医学中的应用正受到临床医生、工程师和科研人员的重视.目的:综述 3D 打印技术在骨科康复学方面的发展情况.方法:应用计算机检索 CNKI 数据库、万方数据库、PubMed 数据库及 Elsevier

数据库中 2011 至 2019 年收录的相关文献,中文检索词为“3D 精准打印、骨科康复医学、人工智能”,英文检索词为“3D Precision Printing,Orthopedic rehabilitation medicine,Artificial Intelligence”。结果与结论:目前,3D 精准打印在骨科康复医学应用中的关键技术,包括医学图像处理与 3D 建模、手术模拟规划系统、手术导板设计、植入物设计与 3D 精准打印装备等.其中通过多层面重组、容积再现技术、最大密度投影、最小密度投影和表面阴影显示等 3D 重建技术读取医学数字数据,实现可视化医学图像处理与 3D 建模,可提升医患沟通效率;通过计算机来模拟医生的康复手术思维过程和智能行为,制造类似于医生人脑智能的云服务中心,辅助医生开展康复手术规划;利用个性化康复手术导板设计软件辅助,可实现移植骨截骨导板为医生规划截骨线和截骨范围,缩短手术时间,提高手术安全性;利用聚合材料、金属材料、陶瓷材料等作为 3D 打印材料还存在力学适配、生理适配不理想等问题;常见生物 3D 设计软件的自动化程度偏低,易出现骨科医疗器械性能与缺损部位的匹配度不理想、植入物内部孔隙结构单一等问题;然而,3D 精准打印技术应用于浸入式康复医学教学系统对于跨学科医工结合的康复医学人才培养有益处。

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=66140

3. 浅论医疗数据及其安全防护

作者：周彬

文献来源：*医学与社会*

摘要：医疗数据主要由患者个人信息结合其接受医疗服务过程中产生的数据组成,因此医疗数据可用度较高、应用范围较广.在物联网、大数据、人工智能等信息技术推动下,其已成为惠民便民服务、临床研究、运营决策、医疗行为监管、卫生政策制定的重要基础.在数字经济时代,医院的数据与信息因其价值巨大而被不法分子所觊觎,目前涉及医院的信息安全事件频发.医院应在《中华人民共和国网络安全法》的指引下,落实信息系统安全等级保护制度,结合医疗卫生行业隐私保护与信息安全规范,采取强有力的措施,保护医疗数据安全.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=66136

4. 智慧医疗环境下的健康扶贫模式创新:实践、影响与方向

作者: 司俊霄

文献来源: *卫生软科学*

摘要: 在分析智慧医疗研究现状的基础上进行模型建构,对旌德县“智慧医疗+健康扶贫”的实践进行总结分析,阐述了智慧医疗的嵌入为政府部门、医务人员、贫困人群带来的新挑战新机遇,并提出了健康扶贫模式创新的智能化、标准化、数字化方向,以促进医疗卫生服务体系的发展.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66139

5. 人工智能系统在肺结节检出及良恶性鉴别中的应用研究

作者: 尹泚

文献来源: *中华胸心血管外科杂志*

摘要: 目的:评价人工智能肺结节辅助诊断系统在肺结节检出及良、恶性鉴别的效能。方法:回顾性分析 2016 年 5 月至 2020 年 7 月,于兰州大学第二医院胸外科因肺结节就诊的 199 例患者的临床资料,将术前胸部 CT 导入人工智能系统,记录检出肺结节的直径、密度分类、恶性风险值。计算人工智能系统对肺结节的检出率,计算人工智能系统在肺结节良恶性鉴别的敏感性、特异性、阳性似然比、阴性似然比,评价其诊断效能并与人工阅片进行比较,以及在肺结节不同大小及密度情况下对肺结节良、恶性鉴别的敏感性及特异性。

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66137

6. Predictive analytics on open big data for supporting smart transportation services

作者: F, Balbin PP

文献来源: *Procedia Comput Sci*

摘要: In the current era of big data, huge quantities of valuable data, which may be of different levels of veracity, are being generated at a rapid rate. Embedded into these big data are implicit, previously unknown and potentially useful information and valuable knowledge that can be discovered by data science

solutions, which apply techniques like data mining. There has been a trend that more and more collections of these big data have been made openly available in science, government and non-profit organizations so that people could collaboratively study and analysis these open big data. In this article, we focus on open big data for public transit because public transit (e.g., bus) as a means of transportation is a vital part of many people's lives. As time is a precious resource, bus delays could negatively affect commuters' plans. Unfortunately, they are inevitable. Hence, many existing works focused on predicting bus delays. However, predicting on-time or early buses is also important. For instance, commuters who come to a bus stop on time may still miss their buses if the buses leave early. So, in this article, we examine open big data about bus performance (e.g., early, on-time, and late stops). We analyze the data with frequent pattern mining and make predictions with decision-tree based classification. For illustration, we perform predictive analytics on real-life open big data available on Winnipeg Open Data Portal, about bus performance from Winnipeg Transit. It shows the benefits of predictive analytics on open big data for supporting smart transportation services.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66138

7. Artificial Intelligence and Health in Nepal

作者: van Teijlingen, A

文献来源: *Nepal J Epidemiol*

摘要: The growth in information technology and computer capacity has opened up opportunities to deal with much and much larger data sets than even a decade ago. There has been a technological revolution of big data and Artificial Intelligence (AI). Perhaps many readers would immediately think about robotic surgery or self-driving cars, but there is much more to AI. This Short Communication starts with an overview of the key terms, including AI, machine learning, deep learning and Big Data. This Short Communication highlights so developments of AI in health that could benefit a low-income

country like Nepal and stresses the need for Nepal's health and education systems to track such developments and apply them locally. Moreover, Nepal needs to start growing its own AI expertise to help develop national or South Asian solutions. This would require investing in local resources such as access to computer power/capacity as well as training young Nepali to work in AI.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66128

8. iModulonDB: a knowledgebase of microbial transcriptional regulation derived from machine learning

作者: Rychel, K

文献来源: *Nucleic Acids Res*

摘要: Independent component analysis (ICA) of bacterial transcriptomes has emerged as a powerful tool for obtaining co-regulated, independently-modulated gene sets (iModulons), inferring their activities across a range of conditions, and enabling their association to known genetic regulators. By grouping and analyzing genes based on observations from big data alone, iModulons can provide a novel perspective into how the composition of the transcriptome adapts to environmental conditions. Here, we present iModulonDB (imodulondb.org), a knowledgebase of prokaryotic transcriptional regulation computed from high-quality transcriptomic datasets using ICA. Users select an organism from the home page and then search or browse the curated iModulons that make up its transcriptome. Each iModulon and gene has its own interactive dashboard, featuring plots and tables with clickable, hoverable, and downloadable features. This site enhances research by presenting scientists of all backgrounds with co-expressed gene sets and their activity levels, which lead to improved understanding of regulator-gene relationships, discovery of transcription factors, and the elucidation of unexpected relationships between conditions and genetic regulatory activity. The current release of iModulonDB covers three organisms (*Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis*) with 204 iModulons, and can be

expanded to cover many additional organisms.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66130

9. Longitudinal trends in master track and field performance throughout the aging process: 83,209 results from Sweden in 16 athletics disciplines

作者: Ganse, B

文献来源: *Geroscience*

摘要: In the research of age-related performance declines, the value of cross-sectional versus longitudinal data is an ongoing debate. This paper analyses the largest longitudinal master track and field data set ever published to compare the age-related decline in performance between 16 athletics disciplines in cross-sectional and longitudinal data. The data set contained 83,209 results (64,948 from men, 78.1%; 18,261 from women, 21.9%) from 34,132 athletes (26,186 men, 76.7%; 7946 women, 23.3%), aged 35-97 years. In 61 athletes, 20 or more, and in 312 athletes, 15 or more results were available. The data were analyzed by regression statistics/ANCOVA. Men had a higher performance than women, irrespective of discipline in both cross-sectional and longitudinal data ($p < 0.001$). The performance in cross-sectional data was lower compared with the longitudinal data in all events and at any age ($p \leq 0.007$) except for 1000 m men. The average age was lower in the cross-sectional than the longitudinal data ($p < 0.001$); men 46 and 58 years, women 44 and 56 years, respectively. The annual percentage rate of decline did not differ significantly between cross-sectional and longitudinal data, or between sexes in most disciplines. Performance declines after age 70 were 1.7 times (men) and 1.4 times (women) as steep as before. In conclusion, although longitudinal master athletics data of athletes with 10 and more results has higher average performance and age compared with cross-sectional data, cross-sectional data give a good impression of the annual percentage decline in performance, which was similar in men and women.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66129

10. Mobile-aided diagnosis systems are the future of health care

作者: Ben, Hassen D

文献来源: *East Mediterr Health J*

摘要: Technology has been a driving force in changing the routine duties of physicians. Advances in mobile technologies have given rise to a new term: mHealth (mobile Health). mHealth devices generate big data and integration of mHealth and big data into existing eHealth services, and the continued growth in coverage of mobile cellular networks are new opportunities. This paper provides an overview on mHealth growth and the benefits of its combination with big data analysis for various purposes of health care. We outline our proposed framework for mobile-aided diagnostic systems. We also discuss the opportunities and challenges of mHealth in aiding diagnosis through mobile technologies.

链接: http://pan.ckcest.cn/rcservice//doc?doc_id=66131

[专利]

1. 一种对医疗影像数据进行脱敏处理的方法及系统

申请人: 孟群

发明人: 孟群

摘要: 本发明公开了一种对医疗影像数据进行脱敏处理的方法及系统, 其特征在于, 包括如下步骤: 步骤 1、以历史医疗影像数据为训练集, 利用深度学习卷积神经网络训练出与所设定的图像敏感区域相对应的图像敏感区域识别模型; 步骤 2、读取待处理的医疗影像数据, 分析并确定所述医疗影像数据中的文件属性敏感信息以及通过所述图像敏感区域识别模型确定所述医疗影像数据中的图像内容敏感信息即图像敏感区域; 步骤 3、对所确定的文件属性敏感信息以及图像内容敏感信息进行脱敏处理并记录存储。本发明方法能够保留原始医疗影像数据的格式和图像信息便于后续分析处理, 且能够

去除文本属性和影像内容中的敏感信息。

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=66132

2. 基于医学图像预测血流特征的装置及系统

申请人：深圳科亚医疗科技有限公司

发明人：王昕

摘要：本发明公开了一种基于医学图像预测血流特征的装置及系统，所述装置包括存储器和处理器，所述存储器上存储有计算机可执行指令，所述处理器执行所述计算机可执行指令时，实现如下步骤：获取血管树的图像块和血管相关特征；基于所获取的血管树的图像块和血管相关特征两者，利用学习网络来计算所述血管树的第二血流特征。该装置能够根据采集的目标对象(如人体或动物身体的某个部位)的血管的医学图像的图像信息和血管相关特征两者来对该目标对象的血流特征进行精准的预测，如预测目标对象的血流储备分数(FFR)等血流特征，以根据血流储备分数帮助用户对目标对象进行相应的病理判断或其他处理。

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=66133

[研究报告]

1. 区域卫生信息化环境下的健康医疗大数据共享的应用分析

发布源：李孟

发布时间：2020年

摘要：区域卫生信息化,是社会发 展以及医疗行业发展的必然趋势,能够实现医疗数据信息的共享与优化配置.尤其是大数据技术的应用,实现了整个医疗管理模式的现代化、高效化、一体化,不仅提高了国民的身体素质,而且加快了医疗行业的发展步伐,值得广泛应用与推广.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=66134

主编：李姣

本期编辑：刘燕

地址：北京市朝阳区雅宝路 3 号 邮编：100020

电话：010-52328740/8754 邮件地址：med@ckcest.cn