中国工程科技知识中心
China Knowledge Centre for Engineering Sciences and Technology

《人工智能在医药健康领域战略研究（2035）》参考

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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 05 日

[动态信息]

1. 中国工程院院士潘云鹤：人工智能技术在五大方向上已初露端倪

【中国网财经】中国医学装备人工智能大会日前在京举办，中国医学装备人工智能联盟专家委员会主任、中国工程院院士潘云鹤，通过视频方式发表了关于“人工智能 2.0”的大会报告。

链接：https://baijiahao.baidu.com/s?id=1677882581470724792&wfr=spider&for=pc

2. 人工智能要为你看病了！英媒：AI 将彻底改变治疗方式

【腾讯网】英国《泰晤士报》网站 9 月 9 日刊载题为《在国民保健署的技术革命中，人工智能现在要为你看病了》的报道，作者系记者凯蒂·吉本斯。报道指出，人工智能产品将可能在整个医疗体系中使用。

链接：https://baijiahao.baidu.com/s?id=1677885583206820546&wfr=spider&for=pc

3. AI 辅助诊断开拓医疗新边界

【大洋网】进入 21 世纪 20 年代，人工智能无疑是最受瞩目的科学技术。而人工智能会否让传统的职业走向消亡，这也是最让人担心的话题。在医疗领域，这个问题就变成未来人工智能会取代医生吗？您是选择把生命交到机器手里，还是选择相信医生的经验判断？华中科技大学协和深圳医院的网络技术科副主任吕周平用实际应用举例，人工智能并非替代医生，而更多的是辅助医生，让医生

的精力回归到治疗中来。

链接：https://36kr.com/p/882488666326017

4. 2020 中国医学装备人工智能大会顺利召开 人工智能加速赋能医学装备

【金融界】一年一度的中国医学装备人工智能大会于 9 月 12 日在北京举办。医学装备人工智能是人工智能领域中的重要应用，对于提升医疗服务能力和服务质量具有广阔的前景，特别是在今年抗击新冠肺炎疫情过程中，已经初步崭露头角，多家企业推出的新冠肺炎智能辅助诊断系统、病情评估系统、疾病预测系统，以及自动化机器人等产品在湖北等地的疫情救治中发挥出重要的作用。

链接：https://baijiahao.baidu.com/s?id=1677882090030516820&wfr=spider&for=pc

5. 上海大学 27 个项目参展 2020 工博会 涵盖人工智能、医工结合等多领域

【中国新闻网】2020 中国国际工业博览会是疫情防控常态化背景下中国举办的首个国家级工业展会。本届工博会，上海大学在展品征集上紧紧围绕“智能、互联——赋能产业新发展”的主题要求，重点围绕服务国家重大战略、服务地方经济社会发展、体现学校学科特色和技术可产业化等原则，筛选出 27 个参展项目，项目涵盖了人工智能、医工结合、新材料与新技术等多个领域。

链接：http://www.sh.chinanews.com/kjjy/2020-09-16/80521.shtml

6. Gauss, Cellex Launch First At-Home COVID-19 Antigen Test

【healthitanalytics】Gauss and Cellex recently announced an exclusive partnership to launch the first-ever rapid, at-home COVID-19 antigen test.

链接：https://pharmanewsintel.com/news/gauss-cellex-launch-first-at-home-covid-19-antigen-test

7. AI and machine learning tools can help separate COVID-related claims

【news-medical】As the COVID-19 pandemic has swept the world, researchers have published hundreds of papers each week reporting their findings - many of which have not undergone a thorough peer review process to gauge their reliability.

链接：

https://www.news-medical.net/news/20200916/AI-and-machine-learning-tools-can-help-separate-

COVID-related-claims.aspx

8. Patient Engagement Technology Is a Doorway to Care at AdventHealth

【hitinfrastructure】Like so many hospitals and health systems across the country, the emergence of the novel coronavirus forced AdventHealth to go from zero to sixty launching consumer-focused patient engagement technology.

链接：

https://patientengagementhit.com/news/patient-engagement-technology-is-a-doorway-to-care-at-adventhealth

9. **UIC researchers to develop, test a voice-enabled AI virtual agent to deliver mental health care**

【news-medical】Researchers at University of Illinois Chicago are studying a novel approach to delivering care to those with moderate depression and anxiety: through artificial intelligence, or AI.

链接：

https://www.news-medical.net/news/20200915/UIC-researchers-to-develop-test-a-voice-enabled-AI-virtual-agent-to-deliver-mental-health-care.aspx

10. Using An AI-Powered Chatbot to Meet Patient Needs During COVID-19

【healthitanalytics】Throughout the COVID-19 pandemic, artificial intelligence has helped the healthcare industry navigate the novel and unknown.

链接：

https://healthitanalytics.com/news/using-an-ai-powered-chatbot-to-meet-patient-needs-during-covid-19

[文献速递]

1. 基于人工智能与 5G 技术的服务机器人应用

作者：孙艳茹

文献来源：*科学技术创新*

摘要：服务机器人的诞生能够很好解决当前各行各业的自动化需求.本文研究的是医疗服务机器人,利用人工智能和 5G 技术,将解决流水线上重复的劳动,大大提高工作效率,避免重复、危险的工作,这样创新研究工作时间增多,同时也改变着人们的生活方式.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65487

2. 大数据与骨肿瘤临床研究

作者：华莹奇

文献来源：*中国骨与关节杂志*

摘要：大数据对肿瘤临床研究有非常重要的意义,骨肿瘤病理亚型众多,且发病率均不高,因此导致单一医疗机构的病例数据量比较少,目前国内一些大型的骨肿瘤诊治中心也建立了一定规模的数据库,如积水潭医院的骨肿瘤数据库,然而全国范围的骨肿瘤登记系统及大数据库仍然是空缺.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65486

3. 人工智能在肿瘤放射治疗中的应用

作者：吴双

文献来源：*中国医疗设备*

摘要：人工智能(Artificial Intelligence,AI)特别是深度学习在医疗领域中表现出非凡的能力,给肿瘤放射治疗带来了突破性的进展.为介绍近三年 AI 在肿瘤放疗领域的进展,本研究检索了 PubMed 和知网两个数据库,同时手工检索纳入研究的参考文献,检索日期从 2014 年 1 月 1 日至 2019 年 7 月 31 日,总共纳入 38 项研究.其中,14 项研究涉及靶区和危及器官的勾画,12 项研究涉及放疗计划的制定,5 项研究涉及预测毒副反应,7 项研究涉及预测预后.实际上,AI 技术已在肿瘤放疗领域取得不错的成绩,并且将在肿瘤放疗中展现更广阔的应用前景.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65488

4. 电子病历数据治理方法的研究

作者：江心怡

文献来源：*中国医院管理*

摘要：电子病历数据治理对提高医疗质量和医疗大数据质量都具有重要作用和意义.针对电子病历数据存在的标准化、准确性、完整性等问题,提出了电子病历数据治理目标,并围绕电子病历整个数据生命周期探讨了各阶段的数据治理方法,形成了较为完整的电子病历数据治理体系.同时从组织机构、相关标准、电子病历质控和数据安全等方面提出了实施电子病历数据治理的对策和建议.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65489

5. **新时期大健康理念推进大数据治理**

作者：谌杰

文献来源：*健康之友*

摘要：大健康理念是依托于当前大数据与云计算等相关人工智能技术的发展而提出的,主要关注人的生老病死,注重人的健康管理.健康越来越成为当前人们最为关注的热点话题之一,必须要充分把握当前的发展趋势,借助当前技术发展来推进大健康产业发展,从有效到推进大数据治理,推动精准医疗或者是免疫治疗等提高人们的医疗卫生保障水平,提高人们健康生活的水平.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65490

6. Microalgae with artificial intelligence: A digitalized perspective on genetics, systems and products

作者：Teng, S Y

文献来源：*Biotechnol Adv*

摘要：With recent advances in novel gene-editing tools such as RNAi, ZFNs, TALENs, and CRISPR-Cas9, the possibility of altering microalgae toward designed properties for various application is becoming a reality. Alteration of

microalgae genomes can modify metabolic pathways to give elevated yields in lipids, biomass, and other components. The potential of such genetically optimized microalgae can give a "domino effect" in further providing optimization leverages down the supply chain, in aspects such as cultivation, processing, system design, process integration, and revolutionary products. However, the current level of understanding the functional information of various microalgae gene sequences is still primitive and insufficient as microalgae genome sequences are long and complex. From this perspective, this work proposes to link up this knowledge gap between microalgae genetic information and optimized bioproducts using Artificial Intelligence (AI). With the recent acceleration of AI research, large and complex data from microalgae research can be properly analyzed by combining the cutting-edge of both fields. In this work, the most suitable class of AI algorithms (such as active learning, semi-supervised learning, and meta-learning) are discussed for different cases of microalgae applications. This work concisely reviews the current state of the research milestones and highlight some of the state-of-art that has been carried out, providing insightful future pathways. The utilization of AI algorithms in microalgae cultivation, system optimization, and other aspects of the supply chain is also discussed. This work opens the pathway to a digitalized future for microalgae research and applications.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65491

7. Current Status and Future Perspectives of Artificial Intelligence in Magnetic Resonance Breast Imaging

作者：Meyer-Base, A

文献来源：*Contrast Media Mol Imaging*

摘要：Recent advances in artificial intelligence (AI) and deep learning (DL) have impacted many scientific fields including biomedical maging. Magnetic resonance imaging (MRI) is a well-established method in breast imaging with several indications including screening, staging, and therapy monitoring. The

rapid development and subsequent implementation of AI into clinical breast MRI has the potential to affect clinical decision-making, guide treatment selection, and improve patient outcomes. The goal of this review is to provide a comprehensive picture of the current status and future perspectives of AI in breast MRI. We will review DL applications and compare them to standard data-driven techniques. We will emphasize the important aspect of developing quantitative imaging biomarkers for precision medicine and the potential of breast MRI and DL in this context. Finally, we will discuss future challenges of DL applications for breast MRI and an AI-augmented clinical decision strategy.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65492

8. **Diagnostic concordance and discordance in digital pathology: a systematic review and meta-analysis**

作者：Azam, A S

文献来源：*J Clin Pathol*

摘 要 ： BACKGROUND: Digital pathology (DP) has the potential to fundamentally change the way that histopathology is practised, by streamlining the workflow, increasing efficiency, improving diagnostic accuracy and facilitating the platform for implementation of artificial intelligence-based computer-assisted diagnostics. Although the barriers to wider adoption of DP have been multifactorial, limited evidence of reliability has been a significant contributor. A meta-analysis to demonstrate the combined accuracy and reliability of DP is still lacking in the literature. OBJECTIVES: We aimed to review the published literature on the diagnostic use of DP and to synthesise a statistically pooled evidence on safety and reliability of DP for routine diagnosis (primary and secondary) in the context of validation process. METHODS: A comprehensive literature search was conducted through PubMed, Medline, EMBASE, Cochrane Library and Google Scholar for studies published between 2013 and August 2019. The search protocol identified all studies comparing DP with light microscopy (LM) reporting for diagnostic purposes,

predominantly including H&E-stained slides. Random-effects meta-analysis was used to pool evidence from the studies. RESULTS: Twenty-five studies were deemed eligible to be included in the review which examined a total of 10 410 histology samples (average sample size 176). For overall concordance (clinical concordance), the agreement percentage was 98.3% (95% CI 97.4 to 98.9) across 24 studies. A total of 546 major discordances were reported across 25 studies. Over half (57%) of these were related to assessment of nuclear atypia, grading of dysplasia and malignancy. These were followed by challenging diagnoses (26%) and identification of small objects (16%). CONCLUSION: The results of this meta-analysis indicate equivalent performance of DP in comparison with LM for routine diagnosis. Furthermore, the results provide valuable information concerning the areas of diagnostic discrepancy which may warrant particular attention in the transition to DP.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65493

9. Treating medical data as a durable asset

作者：Telenti, A

文献来源：*Nat Genet*

摘要：Access to medical data is central for conducting research on genomics. However, to tap these metadata (observable traits and phenotypes, diagnoses and medication, and labels), researchers must grapple with the complex and sensitive nature of the information. In this Perspective, we argue that, at this exciting time for genomics and artificial intelligence, several critical aspects of data generation, infrastructure and management are pillars of a modern data ecosystem. Many risks to privacy and many obstacles to medical research can be eliminated or mitigated by new secure data analytics. Finally, we discuss the potential consequences of medical data exiting the institutions and being managed by individuals. These shifts in data ownership have the potential for profound disruption and opportunity across many fields.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65494

10. The sub-millisievert era in CTCA: the technical basis of the new radiation dose approach

作者：Schicchi, N

文献来源：*Radiol Med*

摘要：Computed tomography coronary angiography (CTCA) has become a cornerstone in the diagnostic process of the heart disease. Although the cardiac imaging with interventional procedures is responsible for approximately 40% of the cumulative effective dose in medical imaging, a relevant radiation dose reduction over the last decade was obtained, with the beginning of the sub-mSv era in CTCA. The main technical basis to obtain a radiation dose reduction in CTCA is the use of a low tube voltage, the adoption of a prospective electrocardiogram-triggering spiral protocol and the application of the tube current modulation with the iterative reconstruction technique. Nevertheless, CTCA examinations are characterized by a wide range of radiation doses between different radiology departments. Moreover, the dose exposure in CTCA is extremely important because the benefit-risk calculus in comparison with other modalities also depends on it. Finally, because anatomical evaluation not adequately predicts the hemodynamic relevance of coronary stenosis, a low radiation dose in routine CTCA would allow the greatest use of the myocardial CT perfusion, fractional flow reserve-CT, dual-energy CT and artificial intelligence, to shift focus from morphological assessment to a comprehensive morphological and functional evaluation of the stenosis. Therefore, the aim of this work is to summarize the correct use of the technical basis in order that CTCA becomes an established examination for assessment of the coronary artery disease with low radiation dose.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65495

11. 基于大数据分析的中国医疗健康管理发展概况综述

作者：罗俊

出版者：*第十四届(2019)中国管理学年会*

摘要：随着大数据时代的深入和医疗信息技术的快速发展，医疗大数据得到了广泛的应用。医疗数据的应用将推动医疗模式的革命性变革，有助于扩大医疗资源的供给，提高医疗服务的效率和质量。本文综述了我国医疗数据分析的发展现状和趋势，以及医疗数据分析在我国的应用。文章还强调了医疗机构实施大数据分析的挑战，最后讨论了我国目前大数据分析的努力。

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65484

12. 大数据视角下的沈阳市医疗资源配置研究

作者：战明松

出版者：*2019 年中国城市规划年会*

摘要：城市医疗资源的空间分布是反映城市空间特征的主要表现.基于沈阳市医疗机构兴趣点(POI)大数据,利用 ArcGIS 软件中最临近指数模块和核密度分析模块量化沈阳市三甲医院、综合医院、卫生院、诊所等医疗机构在市域范围集聚情况和空间布局特征,结合 GIS 技术利用成本路径模块估算居民就医的时间成本,再对不同类型医疗机构时间成本加权计算,得到医疗资源服务覆盖范围.结果 表明,①三甲医院集聚程度最高,综合医院集聚程度最低,最邻近指数分别为 0.15 和 0.67；②三甲医院和综合医院集聚于中心城区,形成单中心的空间格局,卫生院呈斑块状集聚于中心城区,诊所呈斑块状集聚于中心城区和郊区(县)中心；③市域面积 52.23%的地区就医路径消耗的时间成本在(15min-30min)区间,城市中心区和公路沿线就医路径消耗的时间成本最少.研究拓展了兴趣点(POI)在城市地理研究中的应用,为沈阳 15 分钟基本医疗卫生服务圈的资源配置提供科学有效的依据.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=65485

[研究报告]

1. 2020 人工智能医疗产业发展蓝皮书

发布源：工业互联网创新中心

发布时间：2020 年

摘要：近年来，人工智能成为推动社会经济发展的新动力之一，在提高社会生产效率、实现社会发展和经济转型等方面发挥重要作用。作为主导新一代产业变革的 核心力量，人工智能在医疗方面展示出了新的应用方式，在深度融合中又催生出新业态。

链接：http://www.199it.com/archives/1113507.html

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