《人工智能在医药健康领域战略研究（2035）》参考

[动态信息]

1. 中国成为人工智能相关临床试验最主要贡献者

【中国青年报】日前发布的《健康医疗人工智能指数报告》（下称《报告》）显示，中国已成为全球健康医疗人工智能科学研究与临床试验的最主要贡献者之一。

链接：https://baijiahao.baidu.com/s?id=1682314011716678128&wfr=spider&for=pc

2. 我们距离通用人工智能 AGI 到底还有多远？！

【世界智慧】如今，AI 在各领域不断完善的功能和卓越表现，已经引起了全球科技界以及广大公众的警惕。许多人认为人工智能的兴起可以提高我们的生活水平和文明的地位，极大地造福于人类，但也有另一种观点认为，AI 的发展可能会导致人类灭顶之灾。

链接：https://baijiahao.baidu.com/s?id=1682307844603404025&wfr=spider&for=pc

3. 渐冻人智慧生活眼控轮椅亮相"一带一路"人工智能高峰论坛

【西北信息报】10 月 30 日，参加"一带一路"人工智能高峰论坛的嘉宾，在论坛现场亲自体验了由西安电子科技大学智能感知与图像理解教育部重点实验室研发的"渐冻人智慧生活眼控轮椅"。并得到参会嘉宾的关注。

链接：https://dy.163.com/article/FQGKTKE60550A3NK.html

4. 人工智能大会：300 多项 AI 新技术新产品亮相太原

【山西广播电视台融媒体】聚焦"六新"蹚新路，项目为王促转型。10 月 31 日，2020 中国（太原）人工智能大会在太原举办，省内外 300 多项最前沿的人工智能核心技术和尖端产品集中亮相太原，洽谈交流、对接合作，转型中的山西让省内外企业看到"六新"产业发展新机遇。

链接：https://baijiahao.baidu.com/s?id=1682305489384383941&wfr=spider&for=pc

5. "AI+医疗健康领袖峰会"在东莞举行 促进人工智能医疗发展

【中华网】11 月 2 日，2020 粤港澳院士峰会暨第六届广东院士联合会年会专题活动"AI+医疗健康领袖峰会"在东莞举行。与会专家认为，人工智能医疗是医疗卫生技术和通用信息技术深度融合发展的产物，是医疗卫生领域未来发展和转型的方向。

链接：https://tech.china.com/article/20201103/20201103639943.html

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

【healthitanalytics】Eighty-three percent of healthcare organizations have implemented an artificial intelligence strategy, while another 15 percent are planning to develop one, according to a recent survey conducted by Optum.

链接：

https://healthitanalytics.com/news/over-80-of-health-execs-have-artificial-intelligence-plans-in-place

7. RNI researchers to study the impact of excessive speeds on the human brain, body

【news-medical】Before the first Virgin Hyperloop ride takes off, the brains behind pioneering neuroscience research at West Virginia University will help ensure the health and well-being of its passengers and operators.

链接：

https://www.news-medical.net/news/20201030/RNI-researchers-to-study-the-impact-of-excessive-

8. Mayo Clinic, Google to Create Artificial Intelligence for Cancer Care

【**hitinfrastructure**】Mayo Clinic and Google Health have announced a partnership to develop artificial intelligence that can help accelerate the process of planning radiotherapy treatments, leading to more efficient cancer care.

链接：

https://healthitanalytics.com/news/mayo-clinic-google-to-create-artificial-intelligence-for-cancer-care

9. DETECT study: Wearable fitness devices can improve public health efforts to control COVID-19

【**news-medical**】Examining data from the first six weeks of their landmark DETECT study, a team of scientists from the Scripps Research Translational Institute sees encouraging signs that wearable fitness devices can improve public health efforts to control COVID-19.

链接：

https://www.news-medical.net/news/20201029/DETECT-study-Wearable-fitness-devices-can-improve-public-health-efforts-to-control-COVID-19.aspx

10. What Are the Top Challenges of Clinical Decision Support Tools?

【**healthitanalytics**】Clinical decision support systems can help organizations manage large volumes of data while enabling them to deliver quality, value-based care.

链接：

https://healthitanalytics.com/news/what-are-the-top-challenges-of-clinical-decision-support-tools

[文献速递]

1. **深度学习在耳鼻咽喉头颈外科的应用**

   作者：吴庆武

   文献来源：*中华耳鼻咽喉头颈外科杂志*

   摘要：近年来，大数据、人工智能和云计算等技术的快速发展给医疗健康领域带来巨大机遇和挑战。以深度学习（deep learning，DL）为代表的人工智能研究方法在耳鼻咽喉头颈外科疾病诊疗、预后分析及病因研究等方面发挥日益重要的作用。DL 不仅与专家诊断水平相当，而且节约时间和经济成本，但也存在获取高质量大数据和临床推广运用等多方面难题。本文对其相关研究进行回顾分析，探讨其临床运用价值及面临的挑战。

   链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67299

2. **睑板腺缺失面积的图像深度处理分析研究**

   作者：周奕文

   文献来源：*中华眼科杂志*

   摘要：目的:探讨睑板腺图像深度处理分析方法的临床应用价值。方法:诊断评价研究。采集 2017 年 1 月至 2018 年 12 月就诊于武汉大学人民医院眼科中心年龄（40.03±11.46）岁的干眼患者的 2 304 幅睑板腺图像构建睑板腺图像数据库，由 2 名临床医师对图像进行标记，利用深度学习算法建立模型，检测模型对睑板腺识别及标注的准确性并计算睑板腺缺失率。采用平均精度均值（mAP）及验证集损失值评价模型对特征区域识别的准确性。并随机选取 64 幅数据库以外的睑板腺图像，由 7 名受试医师独立评估后与模型评估结果进行统计性 t 检验。 结果:模型对睑结膜进行标记的 mAP>0.976，验证集损失值<0.35；对睑板腺标记的 mAP>0.922，验证集损失值<1.0。模型标记的睑板腺比例为 53.24%±11.09%，人工标记为 52.13%±13.38%，差异无统计学意义（ t=1.935， P>0.05）。模型评价每幅图像仅需 0.499 s，而临床医师用时平均超过 10 s。 结论:该睑板腺图像深度处理方法可提高临床检查结果的准确性，提高诊断效率，可用于睑板腺功能障碍相关疾病的临床辅助诊断和筛查。

   链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67295

3. 人工智能在青年超声医师辅助教学中的作用

作者：张艳

文献来源：*转化医学杂志*

摘要：人工智能(artificial intelligence,AI)是模拟人脑思维的一种新科学,是计算机科学的一个分支.目前已广泛应用于社会各领域,为推动行业发展及社会进步作出了重要贡献,在医学教育领域也发挥着重要作用.本文阐述了 AI 在超声领域的研究及应用情况,并概述了 AI 建立的超声医师临床思维综合训练系统在青年医师规范化培训中的优势与价值:可缩短地区差异,提高整体超声医师队伍的素质,并推动超声医学的发展.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67289

4. 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=67288

5. 基于人工智能肺结节 CT 特征性诊断优势分析

作者：宋振春

文献来源：*影像研究与医学应用*

摘要：目的:探析基于人工智能(Artificial Intelligence,AI)在肺结节特征诊断中

的优势.方法:自我院 CT 数据库选取 2018 年 2 月—2020 年 2 月诊治的经病理证实 150 例肺结节病例 CT 资料纳入研究,均导入肺结节 AI 识别系统,并和原始 CT 诊断影像报告对比,由 2 名胸科专家记录和评估,并对比分析 AI 识别软件和影像科医师诊断效能.结果:本组 150 例病例胸部 CT 检出非钙化结节共 674 枚,其中肺癌结节 101 枚,<5mm 结节 335 枚.AI 识别软件和影像科医师的肺癌检出率均为 100％.通过计算,AI 识别软件的肺结节诊断灵敏度度为 99.5％,显著高于影像科医师的 52.6％(P<0.05).AI 识别软件假阳性率为 4.7 个/例,≥5mm 结节的假阳性率为 1.5 个/例,分别高于影像科医生的 0.015/个、0.005 个/例,差异有统计学意义(P<0.05).结论:基于 AI 系统对恶性肺结节无漏检,诊断灵敏度高于传统影像学科医师,但假阳性率略高.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67291

6. **CT-based radiomics for differentiating renal tumours: a systematic review**

作者：Bhandari, A

文献来源：*Abdom Radiol (NY)*

摘要：PURPOSE: Differentiating renal tumours into grades and tumour subtype from medical imaging is important for patient management; however, there is an element of subjectivity when performed qualitatively. Quantitative analysis such as radiomics may provide a more objective approach. The purpose of this article is to systematically review the literature on computed tomography (CT) radiomics for grading and differentiating renal tumour subtypes. An educational perspective will also be provided. METHODS: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist was followed. PubMed, Scopus and Web of Science were searched for relevant articles. The quality of each study was assessed using the Radiomic Quality Score (RQS). RESULTS: 13 studies were found. The main outcomes were prediction of pathological grade and differentiating between renal tumour types, measured as area under the curve (AUC) for either the receiver operator curve or precision recall curve. Features extracted to predict pathological grade or tumour subtype included shape, intensity, texture and wavelet (a type of higher order feature). Four

studies differentiated between low-grade and high-grade clear cell renal cell cancer (RCC) with good performance (AUC = 0.82-0.978). One other study differentiated low- and high-grade chromophobe with AUC = 0.84. Finally, eight studies used radiomics to differentiate between tumour types such as clear cell RCC, fat-poor angiomyolipoma, papillary RCC, chromophobe RCC and renal oncocytoma with high levels of performance (AUC 0.82-0.96). CONCLUSION: Renal tumours can be pathologically classified using CT-based radiomics with good performance. The main radiomic feature used for tumour differentiation was texture. Fuhrman was the most common pathologic grading system used in the reviewed studies. Renal tumour grading studies should be extended beyond clear cell RCC and chromophobe RCC. Further research with larger prospective studies, performed in the clinical setting, across multiple institutions would help with clinical translation to the radiologist's workstation.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67290

7. Using Artificial Intelligence to Measure Facial Expression following Facial Reanimation Surgery

作者：Boonipat, T

文献来源：*Plast Reconstr Surg*

摘要：Social interactions are largely dependent on the interpretation of information conveyed through facial expressions. Although facial reanimation seeks restoration of the facial expression of emotion, outcome measures have not addressed this directly. This study evaluates the use of a machine learning technology to directly measure facial expression before and after facial reanimation surgery. Fifteen study subjects with facial palsy were evaluated both before and after undergoing cross-facial nerve grafting and free gracilis muscle transfer. Eight healthy volunteers were assessed for control comparison. Video footage of subjects with their face in repose and with a posed, closed-lip smile was obtained. The video data were then analyzed using the Noldus FaceReader software application to measure the relative proportions of seven

cardinal facial expressions detected within each clip. The facial expression recognition application detected a far greater happy signal in postoperative (42 percent) versus preoperative (13 percent) smile videos (p < 0.0001), compared to 53 percent in videos of control faces smiling. This increase in postoperative happy signal was achieved in exchange for a reduction in the sad signal (15 percent to 9 percent; p = 0.092) and the neutral signal (57 percent to 37 percent; p = 0.0012). For video clips of patients in repose, no significant difference in happy emotion was detected between preoperative (3.1 percent) and postoperative (1.4 percent) states (p = 0.5). This study provides the first proof of concept for the use of a machine learning software application to objectively quantify facial expression before and after surgical reanimation. CLINICAL QUESTION/LEVEL OF EVIDENCE:: Diagnostic, IV.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67293

8. Leveraging the wheat germ cell-free protein synthesis system to accelerate malaria vaccine development

作者：Kanoi, B

文献来源：*Parasitol Int*

摘要：Vaccines against infectious diseases have had great successes in the history of public health. Major breakthroughs have occurred in the development of vaccine-based interventions against viral and bacterial pathogens through the application of classical vaccine design strategies. In contrast the development of a malaria vaccine has been slow. Plasmodium falciparum malaria affects millions of people with nearly half of the world population at risk of infection. Decades of dedicated research has taught us that developing an effective vaccine will be time consuming, challenging, and expensive. Nevertheless, recent advancements such as the optimization of robust protein synthesis platforms, high-throughput immunoscreening approaches, reverse vaccinology, structural design of immunogens, lymphocyte repertoire sequencing, and the utilization of artificial intelligence, have renewed the prospects of an

accelerated discovery of the key antigens in malaria. A deeper understanding of the major factors underlying the immunological and molecular mechanisms of malaria might provide a comprehensive approach to identifying novel and highly efficacious vaccines. In this review we discuss progress in novel antigen discoveries that leverage on the wheat germ cell-free protein synthesis system (WGCFS) to accelerate malaria vaccine development.

链接：http://pan.ckcest.cn/rcservice//doc?doc_id=67292

9. Dynamic locomotion synchronization of bipedal robot and human operator via bilateral feedback teleoperation

作者：Ramos, J

文献来源：*Sci Robot*

摘要：Despite remarkable progress in artificial intelligence, autonomous humanoid robots are still far from matching human-level manipulation and locomotion proficiency in real applications. Proficient robots would be ideal first responders to dangerous scenarios such as natural or man-made disasters. When handling these situations, robots must be capable of navigating highly unstructured terrain and dexterously interacting with objects designed for human workers. To create humanoid machines with human-level motor skills, in this work, we use whole-body teleoperation to leverage human control intelligence to command the locomotion of a bipedal robot. The challenge of this strategy lies in properly mapping human body motion to the machine while simultaneously informing the operator how closely the robot is reproducing the movement. Therefore, we propose a solution for this bilateral feedback policy to control a bipedal robot to take steps, jump, and walk in synchrony with a human operator. Such dynamic synchronization was achieved by (i) scaling the core components of human locomotion data to robot proportions in real time and (ii) applying feedback forces to the operator that are proportional to the relative velocity between human and robot. Human motion was sped up to match a faster robot, or drag was generated to synchronize the operator with a slower

robot. Here, we focused on the frontal plane dynamics and stabilized the robot in the sagittal plane u

链接：

10. XAI-Explainable artificial intelligence

作者：Gunning, D

文献来源：*Sci Robot*

摘要：Explainability is essential for users to effectively understand, trust, and manage powerful artificial intelligence applications.

链接：

[专利]

1. 一种基于数据挖掘的医学知识库系统

申请人：华北理工大学

发明人：*阎红灿*

摘要：本发明公开了数据挖掘技术领域的一种基于数据挖掘的医学知识库系统，包括领域知识库索引层，所述领域知识库索引层通过串口通信与用户界面显示层连接，所述结果输出单元电性输出连接用户界面显示，本发明支持数据挖掘的知识库系统知识组织层次清晰，能够管理多种类型的领域知识，通过有效的知识获取方法和技术，获得医学领域专家的知识和经验，采用医学领域知识库，在知识工程中结构化，易操作和易利用，采用专家系统，使其具有知识与控制程序分离的架构，具有弹性与易扩充维护的特点，良好的人机交互界面，可被应用于构建整个自动化系统中每一个知识密集的环节，以辅助人的脑力决策工作。。

链接：

2. 一种基于脊柱超声冠状面图像的自动化椎体识别方法

申请人：浙江工业大学

发明人：*姜娓娓*

摘要：一种基于脊柱超声冠状面图像的自动化椎体识别方法，所述方法包括以下步骤：1)利用超声图像分割技术实现目标脊柱节段超声图像中椎体的逐节分割；2)根据特征性解剖结构、特征椎体和椎体特征结构予以识别，并根据特征性解剖结构判断识别特征椎体，再由特征椎体推算其他椎体；3)通过特征性解剖结构和椎体特征进行验证校准。本发明兼顾超声骨质图像特征的准确与高效识别，以原创性脊柱超声图像分割技术方法，识别脊柱不同节段脊椎的特征性解剖结构，并由此判断识别特征椎体，进而按照脊柱长轴方向，由特征椎体计数推导其它椎体，直至目标手术节段，最后通过双向计数推导识别特征性解剖结构和特征椎体，完成识别验证与校准。链接：

[研究报告]

1. 2020 年中国人工智能 API 经济白皮书

发布源：艾瑞咨询

发布时间：2020 年

摘要：概念界定：API 是应用编程接口的缩写，通过 API，一方以特定方式发送远程请求，而无需了解对方内部系统的逻辑，即可访问对方开放的资源，资源即服务。API 已成为企业内外部系统集成的重要手段，通过 API 快速构建产品和服务，迅速响应客户需求成为优秀企业的必备技能，API 经济应运而生。

链接：http://www.chuangze.cn/third_1.asp?txtid=2965