Date: 2025-07-24

DP2Unlearning: An efficient and guaranteed unlearning framework for LLMs

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: Large language models (LLMs) have recently revolutionized language processing tasks but have also brought ethical and legal issues. LLMs have a tendency to memorize potentially private or copyrighted information present in the training data, which might then be delivered to end users at inference time. When this happens, a naive solution is to retrain the model from scratch after excluding the undesired data. Although this guarantees that the target data have been forgotten, it is also...

Link

LLM-based approaches for automated vocabulary mapping between SIGTAP and OMOP CDM concepts

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: In the context of global healthcare systems, integrating diverse medical terminologies and classification systems has become a priority due to the adoption of Electronic Health Record (EHR) systems and the imperative for information exchange between healthcare systems. This study addresses the necessity for mapping between the SIGTAP vocabulary used in Brazilian healthcare systems and the broader medical terms of the OMOP CDM terminologies. Two distinct pipelines are evaluated for the vocabulary...

Link

A Weighted Voting Approach for Traditional Chinese Medicine Formula Classification Using Large Language Models: Algorithm Development and Validation Study

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: This study aims to explore the effectiveness of LLMs in the TCM formula classification task. To this end, we propose an ensemble

learning method that integrates multiple fine-tuned LLMs through a voting mechanism. This method not only improves classification accuracy but also enhances the existing classification system for classifying the efficacy of TCM formula.

Link

A natural language processing approach to support biomedical data harmonization: Leveraging large language models

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: NLP techniques (especially LLMs), combined with ensemble learning, hold great potential in automating variable matching and accelerating biomedical data harmonization.

Link

Evaluation of ChatGPT-4 as an Online Outpatient Assistant in Puerperal Mastitis Management: Content Analysis of an Observational Study

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: ChatGPT demonstrated adequate capability in providing information on puerperal mastitis, particularly for treatment and prognosis. However, evaluator variability and the subjective nature of assessments highlight the need for further optimization of AI tools. Future research should emphasize iterative questioning and dynamic updates to AI knowledge bases to enhance reliability and accessibility.

Link

Leveraging AI to Investigate Child Maltreatment Text Narratives: Promising Benefits and Addressable Risks

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: The trove of information contained in child maltreatment narratives represents an opportunity to strengthen the evidence base for policy reform in

this area, yet it remains underutilized by researchers and policy makers. Current research into child maltreatment often involves the use of qualitative methodologies or structured survey data that are either too broad or not representative, thereby limiting the development of effective policy responses and intervention strategies. Artificial...

Link

Improving Large Language Models' Summarization Accuracy by Adding Highlights to Discharge Notes: Comparative Evaluation

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: Feeding LLMs with highlighted discharge notes, combined with prompt engineering, results in higher-quality summaries in terms of correctness, completeness, and structural integrity compared to unhighlighted discharge notes.

Link

ASCE-PPIS: A Protein-Protein Interaction Sites Predictor Based on Equivariant Graph Neural Network with Fusion of Structure-Aware Pooling and Graph Collapse

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: MOTIVATION: Identifying protein-protein interaction sites constitutes a crucial step in understanding disease mechanisms and drug development. As experimental methods for PPIS identification are expensive and time-consuming, numerous computational screening approaches have been developed, among which graph neural network based methods have achieved remarkable progress in recent years. However, existing methods lack the utilization of interactions between amino acid molecules and fail to address...

Link

Stigmatizing Language in Large Language Models for Alcohol and Substance Use Disorders: A Multimodel Evaluation and Prompt Engineering Approach

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: LLMs frequently generated stigmatizing language when discussing alcohol-related and substance use-related conditions, potentially undermining patient-centered care. However, targeted prompt engineering substantially reduced stigmatizing language occurrences across diverse models. These findings emphasize the need for ongoing model refinement and structured prompting strategies to ensure stigma-free language in health care communication.

Link

Examining the Efficacy of Large Language Models for Mitigating Depression and Anxiety Among Chinese Students: A Randomized Controlled Trial

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: Secondary school students undergo significant psychological and physiological changes during adolescence, increasing their vulnerability to mental health issues. However, existing mental health services are inadequate to address the growing demand. To bridge this gap, we developed WarmGPT, a conversational mental health service robot utilizing a large language model integrated with cognitive- behavioral therapy, aimed at supporting secondary school students. In this study, 40 students from a...

Link

ChatGPT-4 in Neurosurgery: Improving Patient Education Materials

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Existing PEMs published by the top US hospitals for common neurosurgical conditions may be too complicated for the average American that reads at an eighth-grade level. Large language model chatbots can

be used to efficiently rewrite these PEMs at a lower reading level while maintaining the accuracy of the material.

Link

The Digital Standardized Patient: An Artificial Intelligence Coach for Cultural Dexterity in Surgical Care

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: This pilot study demonstrates the promise of SP-LLMs as scalable tools for advancing cultural dexterity training in surgical education and beyond. Residents found the platform clinically relevant and effective for practicing culturally sensitive communication. With continued development, SP-LLMs have the potential to broaden access to high-quality, scenario-based training across medical specialties and institutions.

Link

Academic writing and critical appraisal in physiology education: discerning the benefits of using large language models as knowledge receivers or knowledge providers

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

MentalRoBERTa-Caps: A capsule-enhanced transformer model for mental health classification

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: In recent years, the dominance of Large Language Models (LLMs) such as BERT and RoBERTa has led to remarkable improvements in NLP tasks, including mental illness detection from social media text. However, these models are often computationally intensive, requiring significant processing time and resources, which limits their applicability in real-time or resource-constrained

environments. This paper proposes a lightweight yet effective hybrid model that integrates a 6-layer RoBERTa encoder with...

Link

Generative artificial intelligence in diabetes healthcare

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: The rapid advancement of generative artificial intelligence (AI) has been fueled by breakthroughs in large language models and applications across diverse domains, from creative content to scientific discovery. Its strength lies in modeling, simulating, and generating high-fidelity data. In diabetes care, generative AI enables solutions to challenges such as data scarcity, patient variability, and personalization. This article explores key deep generative models, including variational...

Link

Applications of large language models in cardiovascular disease: a systematic review

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality worldwide. Large language models (LLMs) offer potential solutions for enhancing patient education and supporting clinical decision-making. This study aimed to evaluate LLMs' applications in CVD and explore their current implementation, from prevention to treatment. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, this systematic review assessed LLM applications in CVD. A...

Link

Improving large language models accuracy for aortic stenosis treatment via Heart Team simulation: a prompt design analysis

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Prompt design significantly impacts LLM performance in clinical decision-making for severe aortic stenosis. Tree-of-Thought prompting

markedly improved accuracy and aligned recommendations with expert decisions, though LLMs tended toward conservative treatment approaches.

Link

Automated transformation of unstructured cardiovascular diagnostic reports into structured datasets using sequentially deployed large language models

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: We developed and validated a novel approach using paired large and moderate-sized LLMs to transform free-text echocardiographic reports into tabular datasets.

Link

Limitations of Current Machine-Learning Models in Predicting Enzymatic Functions for Uncharacterized Proteins

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: Thirty to seventy percent of proteins in any given genome have no assigned function and have been labeled as the protein "unknome". This large knowledge shortfall is one of the final frontiers of biology. Machine-Learning (ML) approaches are enticing, with early successes demonstrating the ability to propagate functional knowledge from experimentally characterized proteins. An open question is the ability of machine-learning approaches to predict enzymatic functions unseen in the training sets....

Link

Feasibility of a Randomized Controlled Trial of Large AI-Based Linguistic Models for Clinical Reasoning Training of Physical Therapy Students: Pilot Randomized Parallel-Group Study

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: While LLMs have the potential to enhance specific digital competencies in physical therapy students, their practical integration into the curriculum faces challenges. Future studies should focus on improving student engagement with LLMs and extending the training period to determine the feasibility of integrating this tool into physical therapy education and maximize benefits.

Link

PepTCR-Net: prediction of multi-class antigen peptides by T-cell receptor sequences with deep learning

Publication Date: Thu, 24 Jul 2025 06:00:00 -0400

Summary: Predicting T-cell receptor (TCR) recognizing antigen peptides is crucial for understanding the immune system and developing new treatments for cancer, infectious and autoimmune diseases. As experimental methods for identifying TCR-antigen recognition are expensive and time-consuming, machine-learning approaches are increasingly used. However, existing computational tools often struggle with generalization due to limited data and challenges in acquiring true non-recognition pairs and rarely...

Link

Large language model-based biological age prediction in large-scale populations

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Accurate and convenient assessment of individual aging is crucial for identifying health risks and preventing aging-related diseases. Nonetheless, current aging proxies often face challenges such as methodological limitations, weak associations with adverse outcomes and limited generalizability. Here we propose a framework that leverages large language models (LLMs) to estimate individual overall and organ-specific aging using only health examination reports. We validated this approach across...

Link

Large-vocabulary forensic pathological analyses via prototypical cross-modal contrastive learning

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Forensic pathology plays a vital role in determining the cause and manner of death through macroscopic and microscopic post-mortem examinations. However, the field faces challenges such as variability in outcomes, labor-intensive processes, and a shortage of skilled professionals. This paper introduces SongCi, a visual-language model tailored for forensic pathology. Leveraging advanced prototypical cross-modal self-supervised contrastive learning, SongCi improves the accuracy, efficiency, and...

Link

Development and evaluation of prompts for a large language model to screen titles and abstracts in a living systematic review

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: Refined GPT-4o prompts demonstrated high sensitivity and moderate specificity while reducing human workload. This approach shows potential for integrating LLMs into systematic review workflows to enhance efficiency.

Link

Letter to the Editor: Expanding on "A Hitchhiker's Guide to Good Prompting Practices for Large Language Models in Radiology"

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

Medical radiology report generation: A systematic review of current deep learning methods, trends, and future directions

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Medical radiology reports play a crucial role in diagnosing various diseases, yet generating them manually is time-consuming and burdens clinical workflows. Medical radiology report generation aims to automate this process using deep learning to assist radiologists and reduce patient wait times. This study presents the most comprehensive systematic review to date on deep learning-based MRRG, encompassing recent advances that span traditional architectures to large language models. We focus on...

Link

Current and emerging data sources for assessment of ovarian toxicity in children, adolescents and young adults with cancer

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: One in 20 cancers occurs in children, adolescents, and young adults, with some treatments leading to infertility or premature ovarian insufficiency. Cancer survivors and clinicians seek to estimate reproductive risks to guide fertility preservation and manage ovarian health post-treatment. Available data focus more on surrogate outcomes like amenorrhea and ovarian reserve markers than clinical outcomes such as ovarian insufficiency. Tools like the Cancer-Related Infertility Score Predictor...

Link

PlantConnectome: a knowledge graph database encompassing >71,000 plant articles

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: One of the main quests in plant biology is understanding how gene products and metabolites work together to form complex networks that drive plant development and responses to environmental stimuli. However, the ever-growing volume and diversity of scientific literature make it increasingly challenging to stay current with the latest advances in functional genetics studies.

Here, we tackled this challenge by deploying the text-mining capacities of large language models to process over 71,000...

Link

Understanding the success and failure of online political debate: Experimental evidence using large language models

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Online political debate is frequently lamented for being toxic, partisan, and counterproductive. However, we know little about how core elements of political debate (justification, tone, willingness to compromise, and partisanship) affect its quality. Using text-based treatments experimentally manipulated with a large language model, we test how these elements causally affect the quality of open-text responses about issues important to the US and UK public. We find substantial evidence that...

Link

Using large language models to extract information from pediatric clinical reports

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Most medical documentation, including clinical reports, exists in unstructured formats, which hinder efficient data analysis and integration into decision-making systems for patient care and research. Both fields could profit significantly from a reliable automatic analysis of these documents. Current methods for data extraction from these documents are labor-intensive and inflexible. Large Language Models (LLMs) offer a promising alternative for transforming unstructured medical documents into...

Link

Perceptions and Attitudes of Chinese Oncologists Toward Endorsing AI-Driven Chatbots for Health Information Seeking Among Patients with Cancer: Phenomenological Qualitative Study

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: While recognizing the potential of AI-driven chatbots to enhance accessibility of health information and chronic disease management, Chinese oncologists report significant concerns, including liability, misinformation, lack of personalization, privacy and data security risks, and patient readiness. Addressing the challenges requires comprehensive solutions, such as clear policies and guidelines, rigorous testing and validation, institutional endorsement, and robust patient and...

Link

Palivizumab for preventing severe respiratory syncytial virus (RSV) infection in children

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: RATIONALE: Respiratory viruses are the leading cause of lower respiratory tract infection and hospitalisation in infants and young children. Respiratory syncytial virus (RSV) is the main infectious agent in this population. Palivizumab is administered intramuscularly every month for five months in the first RSV season to prevent serious RSV lower respiratory tract infection in children. Given its high cost, it is essential to know if palivizumab continues to be effective in preventing severe RSV...

Link

Exploring the value of ChatGPT in selecting antidiabetic agents for type 2 diabetes

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: ChatGPT shows potential as a decision-support tool for selecting anti-diabetic medications, particularly for treatment-naive individuals. Few-shot learning demonstrated improvements in recommendation accuracy, especially for simpler regimens. However, accuracy was notably limited in

complex regimens such as triple therapy, highlighting the need for further refinement before clinical use.

Link

Protein2Text: Resampling Mechanism to Translate Protein Sequences into Human-Interpretable Text

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Proteins play critical roles in biological systems, yet 99.7% of over 227 million known protein sequences remain uncharacterized due to the limitations of experimental methods. To assist experimentalists in narrowing down hypotheses and accelerating protein characterization, we present Protein2Text, a multimodal large language model that interprets protein sequences and generates informative text to address open-ended questions about protein functions and attributes. By integrating a resampling...

Link

How Well Do Different AI Language Models Inform Patients About Radiofrequency Ablation for Varicose Veins?

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Introduction The rapid integration of artificial intelligence (AI) into healthcare has led to increased public use of large language models (LLMs) to obtain medical information. However, the accuracy and clarity of AI-generated responses to patient queries remain uncertain. This study aims to evaluate and compare the quality of responses provided by five leading AI language models regarding radiofrequency ablation (RFA) for varicose veins. Objective To assess and compare the reliability,...

Link

Evaluating the Reliability of OpenAI's ChatGPT-4 in Providing Pre-colonoscopy Patient Guidance

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: The high degree of guideline adherence by ChatGPT-4.0 underscores its viability as a dependable resource for patient education. Despite

its promising results, the study acknowledges limitations such as the structured nature of patient queries and the lack of real patient interactions. The findings suggest a potential role for AI in augmenting patient education and standardizing information dissemination in healthcare.

Link

The Expanded Natural History of Song Discography, A Global Corpus of Vocal Music

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: A comprehensive cognitive science requires broad sampling of human behavior to justify general inferences about the mind. For example, the field of psycholinguistics relies on a rich history of comparative study, with many available resources that systematically document many languages. Surprisingly, despite a longstanding interest in questions of universality and diversity, the psychology of music has few such resources. Here, we report the Expanded Natural History of Song Discography, an...

Link

Empowering tomorrow's public health researchers and clinicians to develop digital health interventions using chatbots, virtual reality, and other AI technologies

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Student feedback underscored course content value, along with guidance to better emphasize how chatbots and augmented/virtual reality are relevant to clinical and public health practices. More applications relevant for diverse populations could elucidate the value of new technologies for students who will develop digital-based interventions. Applications focusing on commonalities could also solidify students' understanding of intervention development principles that will remain, as...

Link

Application of artificial intelligence large language models in drug target discovery

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Drug target discovery is a fundamental aspect of contemporary drug research and development. However, the use of conventional biochemical screening, omics analysis, and related approaches is constrained by substantial technical complexity and significant resource requirements. With the advancement of artificial intelligence-based large language models, notable progress has been achieved in drug target identification. During target mining, large language models with natural language comprehension...

Link

EYE-Llama, an in-domain large language model for ophthalmology

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Training large language models (LLMs) on domain-specific data enhances their performance, yielding more accurate and reliable question-answering (Q&A) systems that support clinical decision-making and patient education. We present EYE-Llama, pretrained on ophthalmology-focused datasets, including PubMed abstracts, textbooks, and online articles, and fine-tuned on diverse Q&A pairs. We evaluated EYE-Llama against Llama 2, Llama 3, Meditron, ChatDoctor, ChatGPT, and several other LLMs. Using BERT...

Link

Codeless Development of a Customized SMILE Nomogram Using a Large Language Model: A Practical Framework for Clinicians

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: Purpose: To evaluate the feasibility of using ChatGPT-4, a large language model (LLM), to develop a customized nomogram calculator for small-incision lenticule extraction (SMILE) surgery based on institution-specific data, without requiring any coding expertise. Customized nomograms are essential due to variations in surgical practices, patient populations, and diagnostic equipment

across vision correction centers. Methods: A retrospective analysis of consecutive patients was performed on data...

Link

The persuasive potential of AI-paraphrased information at scale

Publication Date: Wed, 23 Jul 2025 06:00:00 -0400

Summary: In this article, we study how AI-paraphrased messages have the potential to amplify the persuasive impact and scale of information campaigns. Building from social and cognitive theories on repetition and information processing, we model how CopyPasta-a common repetition tactic leveraged by information campaigns-can be enhanced using large language models. We first extract CopyPasta from two prominent disinformation campaigns in the United States and use ChatGPT to paraphrase the original message...

Link

AgentMRI: A Vison Language Model-Powered AI System for Self-regulating MRI Reconstruction with Multiple Degradations

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: Artificial intelligence (AI)-driven autonomous agents are transforming multiple domains by integrating reasoning, decision-making, and task execution into a unified framework. In medical imaging, such agents have the potential to change workflows by reducing human intervention and optimizing image quality. In this paper, we introduce the AgentMRI. It is an AI-driven system that leverages vision language models (VLMs) for fully autonomous magnetic resonance imaging (MRI) reconstruction in the...

Link

Pitfalls of large language models in medical ethics reasoning

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

The Association of Aortic Stenosis Severity and Symptom Status With Morbidity and Mortality

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: These findings suggest that symptom status, independent of AS severity, is a key risk factor for adverse outcomes. Further research is needed to assess the benefits of early intervention in these high-risk groups.

Link

Large language models' varying accuracy in recognizing risk-promoting and health-supporting sentiments in public health discourse: The cases of HPV vaccination and heated tobacco products

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: Machine learning methods are increasingly applied to analyze health-related public discourse based on large-scale data, but questions remain regarding their ability to accurately detect different types of health sentiments. Especially, Large Language Models (LLMs) have gained attention as a powerful technology, yet their accuracy and feasibility in capturing different opinions and perspectives on health issues are largely unexplored. Thus, this research examines how accurate the three prominent...

Link

Training Language Models for Estimating Priority Levels in Ultrasound Examination Waitlists: Algorithm Development and Validation

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: Language models can estimate the priority of examination requests with accuracy comparable with that of human radiologists. The fine-tuning results indicate that general-purpose language models can be adapted to domain-specific texts (ie, Japanese medical texts) with sufficient fine-

tuning. Further research is required to address priority rank ambiguity, expand the dataset across multiple institutions, and explore more recent language models with potentially higher performance or...

Link

Using Open-Source Large Language Models to Identify Access to Germline Genetic Testing in Veterans With Breast Cancer From Unstructured Text

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: An open-source, locally deployable LLM effectively and efficiently identified germline genetic testing access from clinical notes. LLMs may enhance care quality and efficiency, while safeguarding sensitive data.

Link

mRSubLoc: A novel multi-label learning framework integrating RNA large language model for mRNA subcellular localization

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: The subcellular localization of messenger RNA (mRNA) is essential for the regulation of gene expression and plays a pivotal role in targeted drug development. Although several computational models have been developed to predict mRNA localization, these approaches still face challenges in sequence representation and exhibit limited performance in handling multi-localization tasks. In this paper, we propose mRSubLoc, a novel multi-label deep learning framework for predicting mRNA subcellular...

Link

Video Prediction of Dynamic Physical Simulations With Pixel-Space Spatiotemporal Transformers

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: Inspired by the performance and scalability of autoregressive large language models (LLMs), transformer-based models have seen recent success in

the visual domain. This study investigates a transformer adaptation for video prediction with a simple end-to-end approach, comparing various spatiotemporal self-attention layouts. Focusing on causal modeling of physical simulations over time; a common shortcoming of existing video-generative approaches, we attempt to isolate spatiotemporal reasoning...

Link

Enhancing Perception of Key Changes in Remote Sensing Image Change Captioning

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: Recently, while significant progress has been made in remote sensing image change captioning, existing methods fail to filter out areas unrelated to actual changes, making models susceptible to irrelevant features. In this article, we propose a novel multimodal model for remote sensing image change captioning, guided by Key Change Features and Instruction-tuned (KCFI). This model aims to fully leverage the intrinsic knowledge of large language models through visual instructions and enhance the...

Link

Application of Large Language Models in Stroke Rehabilitation Health Education: 2-Phase Study

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: LLMs, particularly ChatGPT-4 and MedGo, demonstrated promising performance in home-based stroke rehabilitation education. However, discrepancies between expert and patient evaluations highlight the need for improved alignment with patient comprehension and expectations. Enhancing clinical accuracy, readability, and oversight mechanisms will be essential for future real-world integration.

Link

Quantifying uncert-AI-nty: Testing the accuracy of LLMs' confidence judgments

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: The rise of Large Language Model (LLM) chatbots, such as ChatGPT and Gemini, has revolutionized how we access information. These LLMs can answer a wide array of questions on nearly any topic. When humans answer questions, especially difficult or uncertain questions, they often accompany their responses with metacognitive confidence judgments indicating their belief in their accuracy. LLMs are certainly capable of providing confidence judgments, but it is currently unclear how accurate these...

Link

Using generative AI for interview simulations to enhance student research skills in biology education

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: The Longevity Games Interview Simulator provides an innovative approach to preparing students for real-world research interactions by leveraging the capabilities of large language models (LLMs) like OpenAI's GPT-4o and Claude-3.7. This paper outlines the development and demonstrates the benefits of the simulator, designed to mimic interviews with older adults to enhance students' interviewing skills, empathy, and cultural competence. Key outcomes included preparing students for real-world...

Link

Artificial intelligence and the death of the academic author

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: In his essay 'The Death of the Author,' Roland Barthes describes the fiction author as a blender of cultural artifacts. This paper identifies parallels between that activity and the actions currently performed by Large Language Models (LLMs). It then goes further to argue that, in Health Professions Education academia (indeed, all academia), authorship is a mechanical role ideally suited to LLMs, and should be given to LLMs, freeing academic researchers to focus on the actual creative and...

Link

Artificial intelligence in healthcare text processing: a review applied to named entity recognition

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: This systematic review contributes to the advancement of NER in health texts by evaluating methods, showing results and highlighting the wider implications for the field. The article is systematically structured into the following sections: Methodology, Bibliometric analysis, Results and discussion, Threats to validity, Future work and Conclusion. This systematic organization provides a comprehensive review of the research, its impact and future directions, highlighting the...

Link

Evaluation of Large Language Models to Detect Team Mental Model Misalignments During Cardiac Surgery

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

Comparing the Quality and Readability of ChatGPT-4-Generated vs. Human-Generated Patient Education Materials for Total Knee Arthroplasty

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: Background The purpose of this study was to evaluate the potential role of artificial intelligence, specifically ChatGPT-4, in generating patient education materials (PEMs) for total knee arthroplasty (TKA). The aim of our study was to compare the quality and readability of PEMs for TKA generated by ChatGPT-4 with those created by human experts to assess the potential for the use of AI in patient education. Materials and methods We assessed the quality and readability of TKA PEMs produced by...

Link

Artificial Intelligence-Driven Analysis Identifies Anterior Cruciate Ligament Reconstruction, Hip Arthroscopy and Femoroacetabular Impingement Syndrome, and Shoulder Instability as the Most Commonly Published Topics in Arthroscopy

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: Using BERTopic, the study showed an efficient way to analyze large amounts of data to establish patterns within orthopaedic sports medicine literature. This study shows the capacity of the BERTopic model to synthesize thousands of articles within Arthroscopy: The Journal of Arthroscopic and Related Surgery into 35 key topics. The ability to process large amounts of data with accuracy and efficiency provides a powerful tool for establishing and defining the current landscape and...

Link

Using AI to model future societal instability

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: This paper develops a model that aims to pinpoint the future structural constraints facing a number of countries and the instability that may result from these constraints. The model uses existing datasets and extrapolates major patterns several decades into the future based on past patterns. Contrary to predictions of looming crisis in certain states by Turchin and others, the argument is that a more likely scenario is an increasing inability to cope with the combination of fiscal constraints...

Link

Evaluating multiple large language models on orbital diseases

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: The avoidance of mistakes by humans is achieved through continuous learning, error correction, and experience accumulation. This process is known to be both time-consuming and laborious, often involving numerous detours. In

order to assist humans in their learning endeavors, ChatGPT (Generative Pre-trained Transformer) has been developed as a collection of large language models (LLMs) capable of generating responses that resemble human-like answers to a wide range of problems. In this study, we...

Link

AI-powered smart emergency services support for 9-1-1 call handlers using textual features and SVM model for digital health optimization

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: In emergency situations, 9-1-1 is considered the first point of contact, and their call handlers play a crucial role in managing the emergency response. Due to the large number of daily calls and the hectic routine, there are severe chances that the call handlers can make any mistake or human error during data taking in a high-pressure environment. These mistakes or errors impact 9-1-1 performance in emergencies. To address this problem, this research introduces an AI-powered digital health...

Link

Assessing WildfireGPT: a comparative analysis of AI models for quantitative wildfire spread prediction

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: This study examines the application of WildfireGPT for wildfire forecasting, focusing on its limitations in quantitative predicting Fire Radiative Power (FRP) spread and comparing its performance with a specialized predictive model based on TabNet. While WildfireGPT is widely accessible and convenient for wildfire-related discussions, it lacks the specialized training, real-time data integration, and algorithmic precision required for reliable wildfire forecasting. To highlight these...

Link

Computational Sentence-Level Metrics of Reading Speed and Its Ramifications for Sentence Comprehension

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: The majority of research in computational psycholinguistics on sentence processing has focused on word-by-word incremental processing within sentences, rather than holistic sentence-level representations. This study introduces two novel computational approaches for quantifying sentence-level processing: sentence surprisal and sentence relevance. Using multilingual large language models (LLMs), we compute sentence surprisal through three methods, chain rule, next sentence prediction, and negative...

Link

Artificial intelligence-simplified information to advance reproductive genetic literacy and health equity

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: STUDY QUESTION: Can artificial intelligence (AI) and large language models (LLMs) effectively simplify patient education materials (PEMs) to advance reproductive genetic literacy and health equity?

Link

Improving mortality prediction after radiotherapy with large language model structuring of large-scale unstructured electronic health records

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: General-domain LLMs, despite not being fine-tuned for medical data, can effectively structure large-scale unstructured EHRs, significantly improving survival prediction accuracy and model interpretability. The RT-Surv framework highlights the potential of LLMs to enhance clinical decision-making and optimize RT treatment.

Link

Comparing AI-Generated and Human Peer Reviews: A Study on 11 Articles

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: While the peer review process remains the gold standard for evaluating the quality of scientific articles, it is facing a crisis due to the increase in submissions and prolonged review times. This study assessed ChatGPT's ability to formulate editorial decisions and produce peer reviews for surgery-related manuscripts. We tested the hypothesis that ChatGPT's peer review quality exceeds that of human reviewers. Eleven published articles in the field of hand surgery, initially rejected by one...

Link

Natural language processing for scalable feature engineering and ultra-high-dimensional confounding adjustment in healthcare database studies

Publication Date: Tue, 22 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Supplementing administrative claims with large numbers of NLP-generated features for ultra-high-dimensional proxy confounder adjustment improved overall covariate balance and may provide a modest benefit in terms of capturing confounder information.

Link

Accuracy of ChatGPT, Gemini, Copilot, and Claude to Blepharoplasty-Related Questions

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: ChatGPT demonstrated superior performance in both medical accuracy and clinical relevance among evaluated LLMs regarding upper eyelid blepharoplasty, particularly excelling in postoperative monitoring and follow-up categories. While all models generated complex texts requiring advanced literacy, ChatGPT's detailed responses offer valuable guidance for ophthalmologists managing upper eyelid blepharoplasty cases.

Link

ChatGpt's accuracy in the diagnosis of oral lesions

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Although ChatGPT-4.0 demonstrated satisfactory accuracy in answering clinical questions, its responses should not be exclusively relied upon for diagnostic purposes. Instead, the model should be utilized as a complementary tool under the supervision of clinicians in the diagnosis of oral lesions.

Link

Enhancing EHR-based pancreatic cancer prediction with LLM-derived embeddings

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: Pancreatic cancer (PC) is often diagnosed late, as early symptoms and effective screening tools are lacking, and genetic or familial factors explain only ~10% of cases. Leveraging longitudinal electronic health record (EHR) data may offer a promising avenue for early detection. We developed a predictive model using large language model (LLM)-derived embeddings of medical condition names to enhance learning from EHR data. Across two sites-Columbia University Medical Center and Cedars-Sinai...

Link

Clinical and economic impact of a large language model in perioperative medicine: a randomized crossover trial

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: Preoperative assessment is a critical but time-consuming component of perioperative care, often hindered by poor guideline adherence and high documentation burdens. This study evaluates the impact of PEACH (PErioperative AI CHatbot), an LLM-based clinical decision support system, on documentation efficiency, quality, user acceptance, and cost-effectiveness in preoperative consultations. PEACH did not significantly reduce overall documentation time in this randomized crossover trial involving...

Link

Evaluating the role of large language models in traditional Chinese medicine diagnosis and treatment recommendations

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: Digital health technologies hold significant potential for reducing global healthcare disparities. Large language models (LLMs) offer new opportunities to enhance access to culturally specific healthcare, including traditional Chinese medicine (TCM). This study evaluated the diagnostic and treatment performance of seven publicly available LLMs using a real-world acupuncture case, comparing their outputs with three professional acupuncturists across five domains: Western diagnosis, TCM diagnosis,...

Link

Large language models in public health: opportunity or threat? The case of button battery injuries

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: The present findings suggested the potential feasibility of LLMs in public health for preventing paediatric injuries.

Link

A generalized LLMs framework to support public health financing through probabilistic predictions and uncertainty quantification

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: As a systemic problem, public health cannot be addressed without considering other policy dimensions. Hence, a holistic approach across public policy areas is necessary to incorporate Health-for-All values into decision-making. However, such multisectoral interventions require public budgets that are effectively mapped into public health outcomes and indicators of their wider determinants. This budget-tagging procedure is high-cost, given that it is often done manually by domain experts. In this...

Link

PointLLM-V2: Empowering Large Language Models to Better Understand Point Clouds

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: The unprecedented advancements in Large Language Models (LLMs) have shown a profound impact on natural language processing but are yet to fully embrace the realm of 3D understanding. This paper introduces PointLLM, a preliminary effort to fill this gap, empowering LLMs to understand point clouds and offering a new avenue beyond 2D data. PointLLM understands colored object point clouds with human instructions, including coordinate-based part specifications, and generates contextually appropriate...

Link

LLM-driven Medical Report Generation via Communication-efficient Heterogeneous Federated Learning

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: Large Language Models (LLMs) have demonstrated significant potential in Medical Report Generation (MRG), yet their development requires large amounts of medical image-report pairs, which are commonly scattered across multiple centers. Centralizing these data is exceptionally challenging due to privacy regulations, thereby impeding model development and broader adoption of LLM-driven MRG models. To address this challenge, we present FedMRG, the first framework that leverages Federated Learning...

Link

Clinical and perioperative outcomes of abdominal wall reconstruction and panniculectomy in a single surgical procedure: experience from a high-complexity center in bogotá, Colombia

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Abdominal wall reconstruction combined with panniculectomy is a feasible surgical strategy that not only restores the dynamic functionality of the abdominal wall but also improves the patient’s aesthetic

appearance. This study represents the first published experience in Latin America aiming to evaluate the safety, feasibility, and clinical benefits of this combined approach in real-world medical practice.

Link

Toward Real-time Detection of Drug-induced Liver Injury Using Large Language Models: A Feasibility Study From Clinical Notes

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: This study demonstrates the potential of LLMs for accurate medication extraction from clinical notes, a crucial step towards real-time DILI risk assessment. However, the system requires further development and clinical validation before implementation. Future work will focus on matching methods, clinical validation, EMR integration, and development of an agentic AI to triage future DILI risk.

Link

OpenAI o1 Large Language Model Outperforms GPT-4o, Gemini 1.5 Flash, and Human Test Takers on Ophthalmology Board-Style Questions

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: OpenAI o1 outperformed GPT-4o, Gemini, and human test takers in answering ophthalmology board-style questions from two question banks and across three complexity levels. These findings highlight advances in AI technology and OpenAI o1's growing potential as an adjunct in ophthalmic education and care.

Link

Evaluating the Use of ChatGPT 3.5 and Bard as Self-Assessment Tools for Short Answer Questions in Undergraduate Ophthalmology

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: ChatGPT 3.5 and Bard can generate accurate and relevant responses to ophthalmology SAQs in most cases. ChatGPT 3.5 demonstrated slightly better performance, particularly for task-oriented questions, suggesting it may be a more effective tool for undergraduate students' self-assessment. However, due to a notable error rate (~20%), AI-generated responses should not be used in isolation and must be cross-referenced with standard textbooks. These tools best suit rapid information...

Link

Large language models in neuro-ophthalmology diseases: ChatGPT vs Bard vs Bing

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: ChatGPT-3.5 and -4.0 are better than Bard and Bing in terms of answer success rate, answer quality, and critical keywords for diagnosis in ophthalmology. This study has broad implications for the field of ophthalmology, providing further evidence that artificial intelligence LLM can aid clinical decision-making through free-text explanations.

Link

Assessing the proficiency of large language models on funduscopic disease knowledge

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: The study provides evidence of the exceptional performance of ChatGPT-4 in the domain of funduscopic disease. With continued enhancements, validated LLMs have the potential to yield unforeseen advantages in enhancing healthcare for both patients and physicians.

Link

General practitioners' opinions of generative artificial intelligence in the UK: An online survey

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: While GPs were cautiously optimistic about generative AI - particularly for documentation and data collection - scepticism

persisted. In particular, around empathy and equity, highlighting the need for guidance on AI integration into primary care.

Link

ChatGPT-polished writing boosts the risk of human-authored manuscripts being miscredited as AI-generated

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

Comprehensive application of artificial intelligence in colorectal cancer: A review

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: Artificial intelligence (AI) is increasingly integrated into the clinical management of colorectal cancer (CRC), playing a role in areas ranging from disease screening and therapy assistance to daily care and prognostic assessment. While AI's capabilities are clear, several challenges, including those related to ethics, data privacy, and deployment, must be addressed to fully realize its potential in driving innovation and advancing medical technologies. In this review, we provide a...

Link

Artificial intelligence in radiology: diagnostic sensitivity of ChatGPT for detecting hemorrhages in cranial computed tomography scans

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Although the model performs well in recognizing imaging modalities, its diagnostic accuracy substantially improves when guided by additional contextual information.

Link

Artificial intelligence in radiology examinations: a psychometric comparison of question generation methods

Publication Date: Mon, 21 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Both the ChatGPT-4o and template-based AIG methods produced MCQs with acceptable psychometric properties. While faculty-written questions were most effective overall, AI-generated questions- especially those from the template-based AIG method-showed strong potential for use in radiology education. However, the small number of items per method and the single-institution context limit the robustness and generalizability of the findings. These results should be regarded as exploratory,...

Link

Artificial intelligence meets dairy cow research: Large language model's application in extracting daily time-activity budget data for a meta-analytical study

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: This study investigates the application of ChatGPT-4 in extracting and classifying behavioral data from scientific literature, focusing on the daily time-activity budget of dairy cows. Accurate analysis of time-activity budgets is crucial for understanding dairy cow welfare and productivity. Traditional methods are time-intensive and prone to bias. This study evaluates the accuracy and reliability of ChatGPT-4 in data extraction and data categorization, considering explicit, inferred, and...

Link

Quality of Human Expert versus Large Language Model Generated Multiple Choice Questions in the Field of Mechanical Ventilation

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: BACKGROUND: Mechanical ventilation (MV) is a critical competency in critical care training, yet standardized methods for assessing MV-related

knowledge are lacking. Traditional multiple-choice question (MCQ) development is resource-intensive, and prior studies have suggested that generative AI tools could streamline question creation. However, the quality of AI-generated MCQs remains unclear.

Link

Lack of Methodological Rigor and Limited Coverage of Generative AI in Existing AI Reporting Guidelines: A Scoping Review

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Existing AI reporting guidelines in medicine have suboptimal methodological rigor, redundancy, and insufficient coverage of GAI applications. Future and updated guidelines should prioritize standardized development processes, multidisciplinary collaboration, and expanded focus on emerging AI technologies like LLMs.

Link

Breathing barriers: bridging lung health, research, and awareness

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: No abstract

Link

Diagnostic performance of Large Language Models (LLMs) compared with physicians in sleep medicine

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: LLMs showed diagnostic performance comparable to experienced sleep clinicians, suggesting their potential as supplementary tools. Future research should explore broader applications and integration.

Link

Functionalized Nanofinger Enhances Pretrained Language Model Performance for Ultrafast Early Warning of Heart Attacks

Publication Date: Sun, 20 Jul 2025 06:00:00 -0400

Summary: Heart attacks are the leading cause of death worldwide, which means an accurate early warning system is needed. Traditional methods, such as an electrocardiogram (ECG) and blood test, usually require expert interpretation and take more than 15 min to obtain diagnostic results, which often results in delayed treatment. Our previous work [Liu, Z. Small 2023, 19(2), e2204719] developed a functionalized nanofinger platform utilizing Raman spectroscopy and machine learning (ML) to detect heart...

Link

Generative artificial intelligence in cardiovascular specialty care: a scoping review

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: CONCLUSIONS: Generative artificial intelligence provides technical support for the intelligent transformation of cardiovascular specialty care, especially effective in the areas of clinical decision support and patient health management. There is an urgent need to solve the existing problems to promote its in-depth application in this field, and it is suggested that future research focuses on the construction of specialized multimodal models.

Link

Evaluation of a retrieval-augmented generation system using a Japanese Institutional Nuclear Medicine Manual and large language model-automated scoring

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: Recent advances in large language models (LLMs) enable domain-specific question answering using external knowledge. However, addressing information that is not included in training data remains a challenge, particularly in nuclear medicine, where examination protocols are frequently updated and

vary across institutions. In this study, we developed a retrieval-augmented generation (RAG) system using 40 internal manuals from a single Japanese hospital, each corresponding to a different examination...

Link

Cognitive plausibility of count-based versus prediction-based word embeddings: A large-scale N400 study

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: The N400 is a central electrophysiological event-related-potential (ERP) marker thought to reflect meaning comprehension in the human brain. Typically, the N400 is larger when a word does not fit into a specific context (e.g., I drink coffee with cream and dog). Thus, one core factor determining the N400 amplitude is thought to be the predictability of a word within its context. Here, both long-term memory associations and short-term discourse context influence the N400 amplitude. In the present...

Link

EEG Emotion Copilot: Optimizing lightweight LLMs for emotional EEG interpretation with assisted medical record generation

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: In the fields of affective computing (AC) and brain-computer interface (BCI), the analysis of physiological and behavioral signals to discern individual emotional states has emerged as a critical research frontier. While deep learning-based approaches have made notable strides in EEG emotion recognition, particularly in feature extraction and pattern recognition, significant challenges persist in achieving end-to-end emotion computation, including rapid processing, individual adaptation, and...

Link

Large language models: unlocking new potential in patient education for thyroid eye disease

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: Overall, LLMs, as a powerful tool, demonstrate significant potential in generating PEMs for TED. They are capable of producing high-quality, understandable, accurate, and empathetic content, but there is still room for improvement in terms of readability.

Link

Evaluating large language models for WAO/EAACI guideline compliance in hereditary angioedema management

Publication Date: Sat, 19 Jul 2025 06:00:00 -0400

Summary: CONCLUSION: ChatGPT and Gemini demonstrated superior adherence to WAO/EAACI guidelines, suggesting that LLMs can support clinical decision-making in rare diseases. However, inconsistencies in citation practices highlight the need for further validation and optimization to enhance reliability in medical applications.

Link