

Tentative Outline

Special/Thematic Issue for the Journal Current Alzheimer Research

Deep Learning for Advancing Alzheimer's Disease Research

Guest Editor: Prof. Yudong Zhang

Scope of the Thematic Issue:

Alzheimer's disease (AD) poses a significant global health challenge, with an increasing number of individuals affected yearly. Deep learning, a subfield of artificial intelligence, has shown immense potential in various domains, including healthcare. This thematic issue of Current Alzheimer Research explores the application of deep learning techniques in advancing our understanding of AD, enabling early diagnosis, predicting disease progression, and developing innovative therapeutic interventions.

Authors are invited to submit their original research or review articles following the submission guidelines of Current Alzheimer Research. All submitted papers will undergo a thorough peer-review process to ensure high scientific quality and relevance to the theme of this thematic issue. Join us in this thematic issue to contribute to the exciting intersection of deep learning and Alzheimer's disease research. Together, we can pave the way for innovative solutions that advance our understanding of AD and improve patient care.

Keywords: Alzheimer's disease, deep learning, image analysis, image segmentation, big data, drug discovery, explainable AI.

Sub-topics:

- **Deep Learning Models for AD Diagnosis:** Development and validation of deep learning models using neuroimaging data (MRI, PET, fMRI) and other relevant biomarkers to enhance the accuracy of AD diagnosis and classification.
- **Predictive Modeling:** Utilizing deep learning algorithms to predict disease progression, cognitive decline, and response to treatment in individuals with AD or at risk of developing the disease.
- **Image Analysis and Segmentation:** Novel deep learning techniques for automated analysis and segmentation of brain structures and AD-related pathology in neuroimaging data, aiding in early detection and monitoring of disease progression.
- **Multi-Modal Data Integration:** Integration of multiple data sources, such as neuroimaging, genetic, and clinical data, using deep learning approaches to uncover complex relationships and identify biomarkers for AD.
- **Generative Models for AD Research:** Application of generative adversarial networks (GANs) and other generative models for data augmentation, synthesis of synthetic AD data, and generation of interpretable disease-related features.
- **Deep Learning in Drug Discovery:** Leveraging deep learning for drug repurposing, identifying potential therapeutic targets, and predicting drug efficacy in AD treatment.
- **Interpretability and Explainability:** Methods to enhance the interpretability and explainability of deep learning models in AD research, promoting transparency and trust in clinical decision-making.
- **Ethical Considerations:** Exploration of ethical implications and considerations in the application of deep learning to AD research, including privacy concerns, bias mitigation, and responsible use of AI technologies.

Schedule:

- Complete Thematic issue submission deadline: **March 31st, 2024**

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