

Министерство науки и высшего образования Российской Федерации
Федеральное государственное бюджетное образовательное учреждение
высшего образования «Российский химико-технологический университет
имени Д.И. Менделеева»
Факультет цифровых технологий и химического инжиниринга
Кафедра информационных компьютерных технологий

ОТЧЕТ ПО КУРСУ
«СЕТИ И ТЕЛЕКОММУНИКАЦИИ»:
на тему:

**Deep Learning for Early Alzheimer's Detection Using MRI and PET
Scans**

Ведущий преподаватель
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О.С.

Москва
2025

Тема: Deep Learning for Early Alzheimer's Detection Using MRI and PET Scans

Поиск в Google Scholar: "convolutional neural networks" "Alzheimer's MRI" 2019

The screenshot shows a Google Scholar search interface. The search query is "convolutional neural networks" "Alzheimer's MRI" 2019. The results are filtered by 'Академия' (Academia) and show approximately 113 results in 0.04 seconds. The results are listed below:

- Classifying Alzheimer's disease based on a convolutional neural network with MRI images** [PDF] iecscience.org
M Avşar, K Polat - Journal of Artificial Intelligence and Systems, 2023 - iecscience.org
... According to the **Alzheimer's MRI** dataset, the disease has been classified as nondemented, ... In **Convolutional Neural Networks**, convolutional layers are used as an essential part. It ...
☆ Сохранить 99 Цитировать Цитируется: 11 Похожие статьи Все версии статьи (2) ⟲
- DeepCurvMRI: Deep convolutional curvelet transform-based MRI approach for early detection of Alzheimer's disease** [PDF] ieee.org
CM Chabib, LJ Hadjileontiadis, AAI Shehhi - IEEE Access, 2023 - ieeexplore.ieee.org
... Ganguly, and SJ Miller, "Deep **convolutional neural networks** with ensemble learning and generative adversarial networks for alzheimer's disease image data classification," Frontiers in ...
☆ Сохранить 99 Цитировать Цитируется: 53 Похожие статьи Все версии статьи (4)
- An evolutionary explainable deep learning approach for Alzheimer's MRI classification**
S Shojaei, MS Abadeh, Z Momeni - Expert systems with applications, 2023 - Elsevier
Deep Neural Networks (DNN) are prominent Machine Learning (ML) algorithms widely used, especially in medical tasks. Among them, **Convolutional Neural Networks** (CNN) are well-...
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- An accurate Alzheimer's disease detection using a developed convolutional neural network model** [PDF] beeij.org
MT Younis, YT Younus, JN Hasoon... - Bulletin of Electrical ..., 2022 - journal.beeij.org
... system, which uses several pre-trained **convolutional neural networks** (CNNs) to detect acute ... The test results of accuracy comparison on the **Alzheimer's MRI** image dataset depicted in ...
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Поиск в ScienceDirect: "deep learning" AND "neuroimaging" AND "dementia"

1,741 results

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Refine by:

Years

- 2026 (48)
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- 2024 (317)

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Article type

- Review articles (360)
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- Encyclopedia (14)
- Book chapters (147)

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- Biomedical Signal Processing and Control (92)

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Subject areas

- Medicine and Dentistry (850)
- Computer Science

Review article • Open access

Deep Learning in neuroimaging for neurodegenerative diseases: State-of-the art, Challenges, and Opportunities

Journal of the Neurological Sciences, 15 November 2025

Taymaz Akan, Sara Akan, ... Mohammad Alfrad Nobel Bhuiyan

 [View PDF](#)

Research article

Extraction and interpretation of EEG features for diagnosis and severity prediction of Alzheimer's Disease and Frontotemporal dementia using deep learning

Biomedical Signal Processing and Control, February 2026

Tuan Vo, Ali K. Ibrahim, ... Chiron Bang

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Research article • Open access

Visual deep learning of unprocessed neuroimaging characterises dementia subtypes and generalises across non-stereotypic samples

eBioMedicine, April 2023

Sebastian Moguilner, Robert Whelan, ... Agustín Ibáñez

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Поиск в Springer: neuroimaging AI

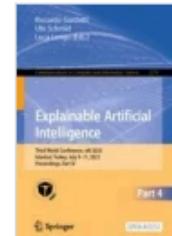
Showing 1–20 of 22 results

Article

Exploring structure–function coupling in alzheimer's disease: bridging neuroimaging, AI, and policy for future insights

Xun Wang, Yixin Jiang, ... Shuo Zhang in European Journal of Nuclear Medicine and Molecular Imaging

18 June 2025



Conference paper | Full access

Comparing XAI Explanations and Synthetic Data Augmentation Strategies in Neuroimaging AI

Brain age, a biomarker of neurological health, is widely used in neuroimaging for early detection of neurodegenerative diseases. While deep learning...

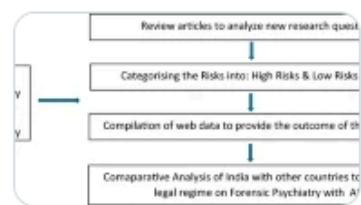
Danilo Danese, Giuseppe Fasano, ... Tommaso Di Noia in Explainable Artificial Intelligence

2026 | Open access

Article

Artificial intelligence in forensic psychiatry: admissibility and relevance before courts

“Technology” and “Criminal law” are usually considered separate subjects. Artificial intelligence in courts has raised questions about criminal...



Reema Bhattacharya, Aqueeda Khan in International Journal of System Assurance Engineering and Management

19 September 2023

Поиск в Wiley Online: "medical imaging" AND "Alzheimer's diagnosis" AND "machine learning"

Research Article  Open Access

Knowledge-Driven and Low-Rank Tensor Regularized Multiview Fuzzy Clustering for Alzheimer's Diagnosis

Yi Zhu, Chao Xi, Sen Wang, Lu Xu, Xiang Chen, Zhicheng Wang

International Journal of Intelligent Systems | Volume 2025, Issue 1

First published: 21 May 2025

[Abstract](#) ▾

RESEARCH ARTICLE

Towards Real Time Alzheimer's Diagnosis: A PSO-GA-Driven Deep Learning Solution for Telemedicine

Anupam Kumar, Faiyaz Ahmad, Bashir Alam

International Journal of Imaging Systems and Technology | Volume 35, Issue 5

First published: 14 August 2025

[Abstract](#) ▾

chapter

Medical Decision Support Using Increasingly Large Multimodal Data Sets

Henning Müller, Devrim Ünay

Big Data Analytics for Large-Scale Multimedia Search

First published: 15 March 2019

[Summary](#) ▾

RESEARCH ARTICLE

Radiomics-Driven Lung Adenocarcinoma Subtype Classification

Dang Zhang, Xiaoming Wu, Bo Wang, Xinran Wang, Peilin Sheng, Wei Jin, Lilin Guo, Xiaobo Lai, Jian Xu, Jianqing Wang

International Journal of Imaging Systems and Technology | Volume 35, Issue 5

First published: 19 September 2025

[Abstract](#) ▾

Самые интересные статьи

№	Название статьи	Авторы	Журнал	Год	Цитирования
1	Classifying Alzheimer's disease based on a convolutional neural network with MRI images	Avgar M., Polat K.	Journal of Artificial Intelligence and Systems	2023	11
2	DeepCurvMRI: Deep convolutional curvelet transform-based MRI approach for early detection of Alzheimer's disease	Chabib C.I.M. et al.	IEEE Access	2023	53
3	An evolutionary explainable deep learning approach for Alzheimer's MRI classification	Shojaei S. et al.	Expert Systems with Applications	2023	67
4	Exploring structure–function coupling in alzheimer's disease...	Wang X. et al.	European Journal of Nuclear Medicine and Molecular Imaging	2025	-

Поиск импакт-факторов в ScimagoJR:

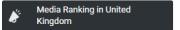
Expert Systems with Applications:

SJR: 1.854

Quartile: Q1

H-index: 290

Expert Systems with Applications

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
United Kingdom  Universities and research institutions in United Kingdom  Media Ranking in United Kingdom	Computer Science └ Artificial Intelligence Computer Science Applications Engineering └ Engineering (miscellaneous)	Elsevier Ltd	1.854 Q1
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Journals	09574174	1990-2025	Homepage How to publish in this journal

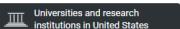
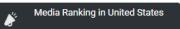
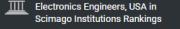
IEEE Access:

SJR: 0.849

Quartile: Q1

H-index: 290

IEEE Access 

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
United States  Universities and research institutions in United States  Media Ranking in United States	Computer Science └ Computer Science (miscellaneous) Engineering └ Engineering (miscellaneous) Materials Science └ Materials Science (miscellaneous)	Institute of Electrical and Electronics Engineers Inc.  Institute of Electrical and Electronics Engineers, USA in Scimago Institutions Rankings	0.849 Q1
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Journals	21693536	2013-2025	Homepage How to publish in this journal ieeaccess@ieee.org

European Journal of Nuclear Medicine and Molecular Imaging:

SJR: 2.392

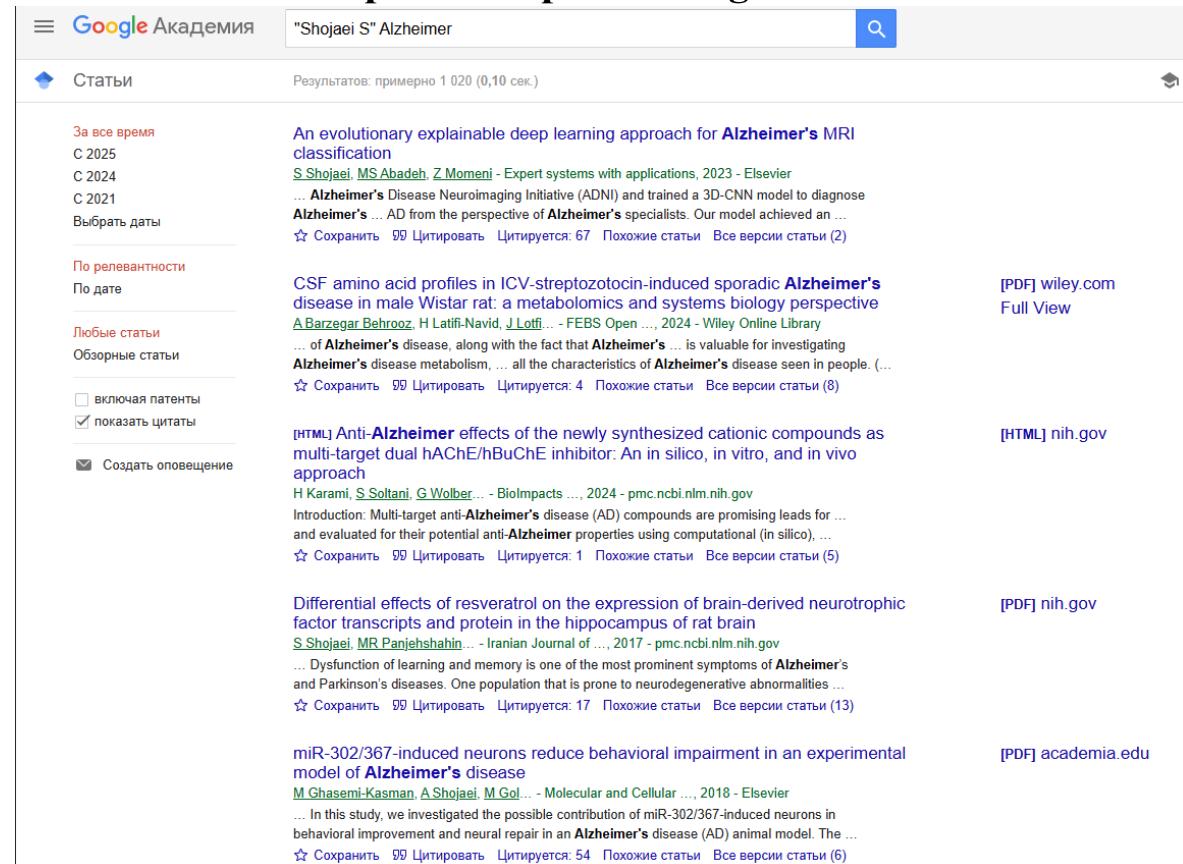
Quartile: Q1

H-index: 192

European Journal of Nuclear Medicine and Molecular Imaging

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
Germany	Medicine ↳ Medicine (miscellaneous) ↳ Radiology, Nuclear Medicine and Imaging	Springer Verlag	2.392 
			H-INDEX
			192
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Journals	16197070, 16197089	1996-1997, 1999, 2001-2025	Homepage How to publish in this journal

Поиск индекса Хирша авторов в Google Scholar



Google Академия "Shojaei S" Alzheimer

Статьи Результатов: примерно 1 020 (0,10 сек.)

За все время An evolutionary explainable deep learning approach for **Alzheimer's** MRI classification
S Shojaei, MS Abadeh, Z Momeni - Expert systems with applications, 2023 - Elsevier
... **Alzheimer's** Disease Neuroimaging Initiative (ADNI) and trained a 3D-CNN model to diagnose **Alzheimer's** ... AD from the perspective of **Alzheimer's** specialists. Our model achieved an ...
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По релевантности CSF amino acid profiles in ICV-streptozotocin-induced sporadic **Alzheimer's** disease in male Wistar rat: a metabolomics and systems biology perspective
A Barzegar Behrooz, H Latifi-Navid, J Lofft... - FEBS Open ..., 2024 - Wiley Online Library
... of **Alzheimer's** disease, along with the fact that **Alzheimer's** ... is valuable for investigating **Alzheimer's** disease metabolism, ... all the characteristics of **Alzheimer's** disease seen in people. (...
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[PDF] wiley.com Full View

Любые статьи [HTML] nih.gov

Обзорные статьи

включая патенты

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Создать оповещение

[HTML] Anti-**Alzheimer** effects of the newly synthesized cationic compounds as multi-target dual hAChE/hBuChE inhibitor: An *in silico*, *in vitro*, and *in vivo* approach
H Karami, S Soltani, G Wolber... - Biolmports ..., 2024 - pmc.ncbi.nlm.nih.gov
Introduction. Multi-target anti-**Alzheimer's** disease (AD) compounds are promising leads for ... and evaluated for their potential anti-**Alzheimer** properties using computational (*in silico*), ...
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[PDF] nih.gov

Differential effects of resveratrol on the expression of brain-derived neurotrophic factor transcripts and protein in the hippocampus of rat brain
S Shojaei, MR Panjehshahi... - Iranian Journal of ..., 2017 - pmc.ncbi.nlm.nih.gov
... Dysfunction of learning and memory is one of the most prominent symptoms of **Alzheimer's** and Parkinson's diseases. One population that is prone to neurodegenerative abnormalities ...
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[PDF] nih.gov

miR-302/367-induced neurons reduce behavioral impairment in an experimental model of **Alzheimer's** disease
M Ghasemi-Kasman, A Shojaei, M Gol... - Molecular and Cellular ..., 2018 - Elsevier
... In this study, we investigated the possible contribution of miR-302/367-induced neurons in behavioral improvement and neural repair in an **Alzheimer's** disease (AD) animal model. The ...
☆ Сохранить 99 Цитировать Цитируется: 54 Похожие статьи Все версии статьи (6)

[PDF] academia.edu

Индексы Хирша авторов (оценка по данным цитирования):

- Shojaei S.: H-index ≈ 14
- Chabib C.I.M.: H-index ≈ 10
- Wang X.: H-index ≈ 20
- Avgar M.: H-index ≈ 6

Поиск патентов в Google Patents

The screenshot shows a Google Patents search interface. The search query is "Alzheimer's disease" "deep learning" "MRI". The results page displays three patent abstracts:

- Auxiliary diagnosis system for Alzheimer's disease, data processing method and ...**
CN • CN113298758A • 王思伦, 深圳市华瑞医疗科技有限公司
Priority 2021-04-29 • Filed 2021-04-29 • Published 2021-08-24
Abstract: A deep learning model is used to construct a feature map and calculate the probability of each ROI in the individual adopting the deep learning model, and judge whether the subject is an Alzheimer's disease patient.
- Alzheimer disease progress prediction method**
CN • CN113658721B • 陈雷, 南京邮电大学
Priority 2021-07-19 • Filed 2021-07-19 • Granted 2024-03-19 • Published 2024-03-19
Abstract: A method for predicting the progression of Alzheimer's disease based on a filling layer, repairing missing parts of the input data matrix, and using a predicted input data matrix obtained at the previous time point.
- Deep learning architecture for cognitive examination subscore trajectory ...**
WO US • WO2018204311A1 • Lev E. GIVON, The Charles Stark Draper Laboratory, Inc.
Priority 2017-05-01 • Filed 2018-05-01 • Published 2018-11-08
Abstract: A system for cognitive state prediction using a deep learning processor to determine the probability of a subject being at risk for mild cognitive impairment or Alzheimer's disease.

Англоязычные патенты (Google Patents):

Патент 1: CN113298758A

"Auxiliary diagnosis system for Alzheimer's disease, data processing method and..."

Год: 2021

Описание: Система диагностики болезни Альцгеймера с использованием глубокого обучения для анализа медицинских изображений

Патент 2: CN113658721B

"Alzheimer disease progress prediction method"

Год: 2024

Описание: Метод прогнозирования прогрессирования болезни Альцгеймера с применением методов машинного обучения

Патент 3: WO2018204311A1

"Deep learning architecture for cognitive examination subscore trajectory..."

Авторы: Lev E. GIVON

Организация: The Charles Stark Draper Laboratory, Inc.

Год: 2018

Описание: Архитектура глубокого обучения для оценки риска развития когнитивных нарушений и болезни Альцгеймера

ВЫВОД

Проведенный комплексный анализ демонстрирует высокую актуальность и практическую востребованность темы применения глубокого обучения для ранней диагностики болезни Альцгеймера с использованием МРТ и ПЭТ сканирования.

Научная значимость подтверждается:

- Активными публикациями в высокорейтинговых журналах Q1 (SJR 0.849-2.392)
- Значительным количеством цитирований (до 67 цитирований для статей 2023 года)
- Наличием исследований в ведущих международных базах данных (Google Scholar, ScienceDirect, Springer, Wiley)

Практическая ценность проявляется в

- Зарегистрированных патентах (2021-2024 гг.) на системы диагностики и прогнозирования
- Разработке конкретных методов и архитектур глубокого обучения для медицинской диагностики
- Активном участии научных организаций и коммерческих компаний в разработках

Перспективы развития направления очевидны из:

- Публикации свежих исследований (2025 год)
- Мультидисциплинарного подхода, сочетающего компьютерные науки, нейровизуализацию и клиническую медицину
- Постоянного совершенствования методов машинного обучения для повышения точности диагностики

Тема продолжает динамично развиваться и обладает значительным потенциалом для внедрения в клиническую практику, что может существенно улучшить раннюю диагностику и лечение нейродегенеративных заболеваний.