
How the Artificial Intelligence Program AlphaZero Mastered Its Games

Item Type Magazine Article
Author James Somers
Abstract At its core was an algorithm so powerful that you could give it the rules of humanity’s richest and most studied games and, later that day, it would become the best player there has ever been.
Date 2018-12-28T10:00:00.000Z
Language en
Library Catalog www.newyorker.com
URL <https://www.newyorker.com/science/elements/how-the-artificial-intelligence-program-alphazero-mastered-its-games>
Accessed 2018-12-29, 4:54:14 p.m.
ISSN 0028-792X
Date Added 2018-12-29, 4:54:14 p.m.
Modified 2018-12-29, 4:55:00 p.m.

Tags:
chess, neural network, AI

Artificial intelligence faces reproducibility crisis

Item Type Journal Article
Author Matthew Hutson
Date 2018
URL <http://science.sciencemag.org/content/359/6377/725>
Volume 359
Pages 725-726
Publication Science
DOI 10.1126/science.359.6377.725
Issue 6377
Date Added 2018-05-18, 2:55:14 p.m.
Modified 2018-05-18, 5:02:07 p.m.

Tags:
reproducible research, AI

Machine learning methods in the environmental sciences

Item Type Book
Author William W Hsieh
Date 2009
Place {C}ambridge, UK
Publisher {C}ambridge {U}niversity {P}ress
Date Added 2018-05-18, 2:56:56 p.m.
Modified 2018-05-19, 4:09:25 p.m.

Tags:

ML

Could robots make us better humans?

Item Type Newspaper Article
Author John Harris
Abstract Machines can already write music and beat us at games like chess and Go. But the rise of artificial intelligence should inspire hope as well as fear, says Marcus du Sautoy
Date 2019-03-05T10:00:46.000Z
Language en-GB
Library Catalog www.theguardian.com
URL <https://www.theguardian.com/technology/2019/mar/05/could-robots-make-us-better-humans>
Accessed 2019-03-05, 4:26:59 p.m.
Section Technology
Publication The Guardian
ISSN 0261-3077
Date Added 2019-03-05, 4:26:59 p.m.
Modified 2023-05-30, 6:18:48 p.m.

Tags:

AI, Art, music

CASP14: what Google DeepMind’s AlphaFold 2 really achieved, and what it means for protein folding, biology and bioinformatics | Oxford Protein Informatics Group

Item Type Blog Post
Author Carlos Outeiral Rubiera
Date 2020
Language en-US
Short Title CASP14
URL <https://www.blopig.com/blog/2020/12/casp14-what-google-deepminds-alphafold-2-really-achieved-and-what-it-means-for-protein-folding-biology-and-bioinformatics/>
Accessed 2021-07-12, 4:23:36 p.m.
Date Added 2021-07-12, 4:23:36 p.m.
Modified 2023-05-30, 6:09:39 p.m.

Tags:
AI, biochemistry

Knowledge Graphs

Item Type Journal Article
Author Aidan Hogan
Author Eva Blomqvist
Author Michael Cochez
Author Claudia d'Amato
Author Gerard de Melo
Author Claudio Gutierrez
Author José Emilio Labra Gayo
Author Sabrina Kirrane
Author Sebastian Neumaier
Author Axel Polleres
Author Roberto Navigli
Author Axel-Cyrille Ngonga Ngomo
Author Sabbir M. Rashid
Author Anisa Rula
Author Lukas Schmelzeisen
Author Juan Sequeda
Author Steffen Staab
Author Antoine Zimmermann

Abstract In this paper we provide a comprehensive introduction to knowledge graphs, which have recently garnered significant attention from both industry and academia in scenarios that require exploiting diverse, dynamic, large-scale collections of data. After some opening remarks, we motivate and contrast various graph-based data models and query languages that are used for knowledge graphs. We discuss the roles of schema, identity, and context in knowledge graphs. We explain how knowledge can be represented and extracted using a combination of deductive and inductive techniques. We summarise methods for the creation, enrichment, quality assessment, refinement, and publication of knowledge graphs. We provide an overview of prominent open knowledge graphs and enterprise knowledge graphs, their applications, and how they use the aforementioned techniques. We conclude with high-level future research directions for knowledge graphs.

Date 07/2021

Library Catalog arXiv.org

URL <http://arxiv.org/abs/2003.02320>

Accessed 2021-10-22, 8:41:41 a.m.

Extra arXiv: 2003.02320

Volume 54

Pages 1-37

Publication ACM Computing Surveys

DOI 10.1145/3447772

Issue 4

Journal Abbr ACM Comput. Surv.

ISSN 0360-0300, 1557-7341

Date Added 2021-10-22, 8:41:41 a.m.

Modified 2023-05-30, 6:20:18 p.m.

Tags:

AI, database, ML, software

Notes:

Comment: Revision from v5: Correcting errata from previous version for entailment/models, and some other minor typos

Why do tree-based models still outperform deep learning on tabular data?

Item Type Journal Article

Author Léo Grinsztajn

Author Edouard Oyallon

Author Gaël Varoquaux

Abstract While deep learning has enabled tremendous progress on text and image datasets, its superiority on tabular data is not clear. We contribute extensive benchmarks of standard and novel deep learning methods as well as tree-based models such as XGBoost and Random Forests, across a large number of datasets and hyperparameter combinations. We define a standard set of 45 datasets from varied domains with clear characteristics of tabular data and a benchmarking methodology accounting for both fitting models and finding good hyperparameters. Results show that tree-based models remain state-of-the-art on medium-sized data ($\sim 10^5$ samples) even without accounting for their superior speed. To understand this gap, we conduct an empirical investigation into the differing inductive biases of tree-based models and Neural Networks (NNs). This leads to a series of challenges which should guide researchers aiming to build tabular-specific NNs: 1. be robust to uninformative features, 2. preserve the orientation of the data, and 3. be able to easily learn irregular functions. To stimulate research on tabular architectures, we contribute a standard benchmark and raw data for baselines: every point of a 20 000 compute hours hyperparameter search for each learner.

Date 2022

Library Catalog DOI.org (Datacite)

URL <https://arxiv.org/abs/2207.08815>

Accessed 2022-08-03, 4:56:08 p.m.

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Extra Publisher: arXiv Version Number: 1

DOI 10.48550/ARXIV.2207.08815

Date Added 2022-08-03, 4:56:08 p.m.

Modified 2023-01-24, 9:38:51 a.m.

Tags:

AI, computation

Talking to whales: can AI bridge the chasm between our consciousness and other animals?

Item Type Newspaper Article

Author Patrick Barkham

Abstract Speaking to animals has long been a fantasy. But now a dizzyingly ambitious project is harnessing all the power of modern science in an attempt to understand what whales say – and then hold conversations with them. By Patrick Barkham

Date 2022-09-18T09:00:09.000Z

Language en-GB

Short Title Talking to whales

Library Catalog The Guardian

URL <https://www.theguardian.com/environment/2022/sep/18/talking-to-whales-with-artificial-enterprise-it-may-soon-be-possible>

Accessed 2022-09-18, 9:38:21 a.m.

Section Environment

Publication The Observer

ISSN 0029-7712

Date Added 2022-09-18, 9:38:21 a.m.

Modified 2023-01-24, 9:43:09 a.m.

Tags:

AI, Cetacean, computation, whale

Sparks of Artificial General Intelligence: Early experiments with GPT-4

Item Type Preprint

Author Sébastien Bubeck

Author Varun Chandrasekaran

Author Ronen Eldan

Author Johannes Gehrke

Author Eric Horvitz

Author Ece Kamar

Author Peter Lee

Author Yin Tat Lee

Author Yuanzhi Li

Author Scott Lundberg

Author Harsha Nori

Author Hamid Palangi

Author Marco Tulio Ribeiro

Author Yi Zhang

Abstract Artificial intelligence (AI) researchers have been developing and refining large language models (LLMs) that exhibit remarkable capabilities across a variety of domains and tasks, challenging our understanding of learning and cognition. The latest model developed by OpenAI, GPT-4, was trained using an unprecedented scale of compute and data. In this paper, we report on our investigation of an early version of GPT-4, when it was still in active development by OpenAI. We contend that (this early version of) GPT-4 is part of a new cohort of LLMs (along with ChatGPT and Google's PaLM for example) that exhibit more general intelligence than previous AI models. We discuss the rising capabilities and implications of these models. We demonstrate that, beyond its mastery of language, GPT-4 can solve novel and difficult tasks that span mathematics, coding, vision, medicine,

law, psychology and more, without needing any special prompting. Moreover, in all of these tasks, GPT-4's performance is strikingly close to human-level performance, and often vastly surpasses prior models such as ChatGPT. Given the breadth and depth of GPT-4's capabilities, we believe that it could reasonably be viewed as an early (yet still incomplete) version of an artificial general intelligence (AGI) system. In our exploration of GPT-4, we put special emphasis on discovering its limitations, and we discuss the challenges ahead for advancing towards deeper and more comprehensive versions of AGI, including the possible need for pursuing a new paradigm that moves beyond next-word prediction. We conclude with reflections on societal influences of the recent technological leap and future research directions.

Date

2023-03-27

Short Title

Sparks of Artificial General Intelligence

Library Catalog

arXiv.org

URL

<http://arxiv.org/abs/2303.12712>

Accessed

2023-04-02, 3:11:29 p.m.

Extra

arXiv:2303.12712 [cs]

DOI

10.48550/arXiv.2303.12712

Repository

arXiv

Archive ID

arXiv:2303.12712

Date Added

2023-04-02, 3:11:29 p.m.

Modified

2023-04-02, 3:11:29 p.m.

Tags:

AI, computation

ChatGPT is making up fake Guardian articles. Here’s how we’re responding

Item Type

Newspaper Article

Author

Chris Moran

Abstract

The risks inherent in the technology, plus the speed of its take-up, demonstrate why it’s so vital that we keep track of it, writes the Guardian’s head of editorial innovation, Chris Moran

Date

2023-04-06T07:00:16.000Z

Language

en-GB

Library Catalog

The Guardian

URL

<https://www.theguardian.com/commentisfree/2023/apr/06/ai-chatgpt-guardian-technology-risks-fake-article>

Accessed

2023-04-07, 6:10:37 a.m.

Section

Opinion

Publication

The Guardian

ISSN 0261-3077

Date Added 2023-04-07, 6:10:37 a.m.

Modified 2023-04-07, 6:10:37 a.m.

Tags:

AI, ChatGPT, technology, The Guardian

Opinion | The Surprising Thing A.I. Engineers Will Tell You if You Let Them

Item Type Newspaper Article

Author Ezra Klein

Abstract This is too important to leave to Microsoft, Google and Facebook.

Date 2023-04-16

Language en-US

Library Catalog NYTimes.com

URL <https://www.nytimes.com/2023/04/16/opinion/this-is-too-important-to-leave-to-microsoft-google-and-facebook.html>

Accessed 2023-04-18, 6:31:05 a.m.

Section Opinion

Publication The New York Times

ISSN 0362-4331

Date Added 2023-04-18, 6:31:05 a.m.

Modified 2023-05-30, 6:17:41 p.m.

Tags:

AI, industry

Learning representations by back-propagating errors

Item Type Journal Article

Author David E. Rumelhart

Author Geoffrey E. Hinton

Author Ronald J. Williams

Date 10/1986

Language en

Library Catalog DOI.org (Crossref)

URL <http://www.nature.com/articles/323533a0>

Accessed 2023-05-07, 3:17:08 p.m.
Volume 323
Pages 533-536
Publication Nature
DOI 10.1038/323533a0
Issue 6088
Journal Abbr Nature
ISSN 0028-0836, 1476-4687
Date Added 2023-05-07, 3:17:08 p.m.
Modified 2023-05-07, 3:17:16 p.m.

Tags:

AI

Notes:

This paper is widely regarded as the start of modern AI research. Among other things, the authors outlined an efficient way to use ever more complicated neural networks in the study of ever larger datasets. And so a tool that had been previously been regarded as bit of a curiosity started to become practical. More use led to more advances in theory, hardware, and software. Advances have been particularly compelling in since the mid 2010s, to the point where most people in the public have at least heard of artificial intelligence (although not all are aware that their cellphones and other personal electronic devices have been using AI tooled for several years).

Attachments

- o Rumelhart et al. - 1986 - Learning representations by back-propagating error.pdf

Welcome · Flux

Item Type Web Page
Date 2023
URL <https://fluxml.ai/Flux.jl/stable/>
Accessed 2023-05-24, 7:33:20 p.m.
Date Added 2023-05-24, 7:33:20 p.m.
Modified 2023-05-30, 6:23:22 p.m.

Tags:

AI, flux, julia, ML

Adam: A Method for Stochastic Optimization

Item Type Journal Article

Author Diederik P. Kingma

Author Jimmy Ba

Abstract We introduce Adam, an algorithm for first-order gradient-based optimization of stochastic objective functions, based on adaptive estimates of lower-order moments. The method is straightforward to implement, is computationally efficient, has little memory requirements, is invariant to diagonal rescaling of the gradients, and is well suited for problems that are large in terms of data and/or parameters. The method is also appropriate for non-stationary objectives and problems with very noisy and/or sparse gradients. The hyper-parameters have intuitive interpretations and typically require little tuning. Some connections to related algorithms, on which Adam was inspired, are discussed. We also analyze the theoretical convergence properties of the algorithm and provide a regret bound on the convergence rate that is comparable to the best known results under the online convex optimization framework. Empirical results demonstrate that Adam works well in practice and compares favorably to other stochastic optimization methods. Finally, we discuss AdaMax, a variant of Adam based on the infinity norm.

Date 2014

Short Title Adam

Library Catalog DOI.org (Datacite)

URL <https://arxiv.org/abs/1412.6980>

Accessed 2023-05-25, 7:41:37 a.m.

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Extra Publisher: arXiv Version Number: 9

DOI 10.48550/ARXIV.1412.6980

Date Added 2023-05-25, 7:41:37 a.m.

Modified 2023-05-25, 7:42:20 a.m.

Tags:

AI, ML

Attachments

- Kingma and Ba - 2014 - Adam A Method for Stochastic Optimization.pdf

Oceanic Primary Production Estimation Based On Machine Learning

Item Type Journal Article

Author Bo Ping
Author Yunshan Meng
Author Cunjin Xue
Author Fenzhen Su
Date 05/2023

Language en

Library Catalog DOI.org (Crossref)
URL <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2022JC018980>
Accessed 2023-05-26, 8:27:43 a.m.
Volume 128
Pages e2022JC018980
Publication Journal of Geophysical Research: Oceans
DOI 10.1029/2022JC018980
Issue 5
Journal Abbr JGR Oceans
ISSN 2169-9275, 2169-9291
Date Added 2023-05-26, 8:27:43 a.m.
Modified 2023-05-26, 8:28:29 a.m.

Tags:

AI, ML, primary production

Deep learning with R

Item Type Book
Author François Chollet
Author Tomasz Kalinowski
Author J. J. Allaire
Date 2022

Library Catalog Library of Congress ISBN
Call Number QA276.45.R3 C46 2022
Place Shelter Island, NY
Publisher Manning
ISBN 978-1-63343-984-9
Edition Second edition
of Pages 548
Date Added 2023-05-26, 10:19:42 a.m.
Modified 2023-05-26, 10:19:42 a.m.

Tags:

computer vision, data processing, ML, neural network, R, statistics

Risk of extinction by AI should be global priority, say experts

Item Type Newspaper Article
Author Geneva Abdul
Abstract Hundreds of tech leaders call for world to treat AI as danger on par with pandemics and nuclear war
Date 2023-05-30T17:10:36.000Z
Language en-GB
Library Catalog The Guardian
URL <https://www.theguardian.com/technology/2023/may/30/risk-of-extinction-by-ai-should-be-global-priority-say-tech-experts>
Accessed 2023-05-30, 6:06:14 p.m.
Section Technology
Publication The Guardian
ISSN 0261-3077
Date Added 2023-05-30, 6:06:14 p.m.
Modified 2023-05-30, 6:08:30 p.m.

Tags:

AI

Statement on AI Risk | CAIS

Item Type Web Page
Author Center for AI Safety
Abstract A statement jointly signed by a historic coalition of experts: “Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war.”
Date May 30, 2023
URL <https://www.safe.ai/statement-on-ai-risk>
Accessed 2023-05-30, 6:08:07 p.m.
Date Added 2023-05-30, 6:08:07 p.m.
Modified 2023-05-30, 6:11:50 p.m.

Tags:

AI

Train and run machine learning models faster | Cloud TPU

Item Type	Web Page
Author	Google Cloud
Abstract	Custom-built for machine learning workloads, Cloud TPUs accelerate training and inference at scale.
Date	2023
Language	en
URL	https://cloud.google.com/tpu
Accessed	2023-05-31, 5:47:22 a.m.
Website Title	Google Cloud
Date Added	2023-05-31, 5:47:22 a.m.
Modified	2023-05-31, 9:25:26 a.m.

Tags:

AI

AlphaFold: a solution to a 50-year-old grand challenge in biology

Item Type	Web Page
Author	AlphaFold Team
Abstract	Proteins are essential to life, supporting practically all its functions. They are large complex molecules, made up of chains of amino acids, and what a protein does largely depends on its unique 3D structure. Figuring out what shapes proteins fold into is known as the “protein-folding problem”, and has stood as a grand challenge in biology for the past 50 years. In a major scientific advance, the latest version of our AI system AlphaFold has been recognised as a solution to this grand challenge by the organisers of the biennial Critical Assessment of protein Structure Prediction (CASP). This breakthrough demonstrates the impact AI can have on scientific discovery and its potential to dramatically accelerate progress in some of the most fundamental fields that explain and shape our world.
Date	Nov 30, 2020
Language	en
Short Title	AlphaFold
URL	https://www.deepmind.com/blog/alphafold-a-solution-to-a-50-year-old-grand-challenge-in-biology
Accessed	2023-05-31, 9:23:52 a.m.

Date Added 2023-05-31, 9:23:52 a.m.

Modified 2023-05-31, 9:25:04 a.m.

Tags:

AI