

Title: PaLM

URL: <https://en.wikipedia.org/wiki/PaLM>

PageID: 73308812

Categories: Category:2022 in artificial intelligence, Category:2022 software, Category:Generative pre-trained transformers, Category:Google software, Category:Large language models

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PaLM (Pathways Language Model) is a 540 billion-parameter dense decoder-only transformer-based large language model (LLM) developed by Google AI . [1] Researchers also trained smaller versions of PaLM (with 8 and 62 billion parameters) to test the effects of model scale. [2]

Model

PaLM is capable of a wide range of tasks, including commonsense reasoning , arithmetic reasoning, joke explanation, code generation, and translation . [2] [3] [4] [5] When combined with chain-of-thought prompting , PaLM achieved significantly better performance on datasets requiring reasoning of multiple steps, such as word problems and logic-based questions . [1] [2]

The model was first announced in April 2022 and remained private until March 2023, when Google launched an API for PaLM and several other technologies. [6] The API was initially available to a limited number of developers who joined a waitlist before it was released to the public. [7]

Google and DeepMind developed a version of PaLM 540B (the parameter count, 540 billion), called Med-PaLM , that is fine-tuned on medical data and outperforms previous models on medical question answering benchmarks. [8] [9] Med-PaLM was the first to obtain a passing score on U.S. medical licensing questions, and in addition to answering both multiple choice and open-ended questions accurately, it also provides reasoning and is able to evaluate its own responses. [10]

Google also extended PaLM using a vision transformer to create PaLM-E , a state-of-the-art vision-language model that can be used for robotic manipulation . [11] [12] The model can perform tasks in robotics competitively without the need for retraining or fine-tuning . [13]

In May 2023, Google announced PaLM 2 at the annual Google I/O keynote. [14] PaLM 2 is reported to be a 340 billion-parameter model trained on 3.6 trillion tokens. [15]

In June 2023, Google announced AudioPaLM for speech-to-speech translation, which uses the PaLM-2 architecture and initialization. [16]

Training

PaLM is pre-trained on a high-quality corpus of 780 billion tokens that comprise various natural language tasks and use cases. This dataset includes filtered webpages, books, Wikipedia articles, news articles, source code obtained from open source repositories on GitHub , and social media conversations. [1] [2] It is based on the dataset used to train Google 's LaMDA model. [2] The social media conversation portion of the dataset makes up 50% of the corpus, which aids the model in its conversational capabilities. [2]

PaLM 540B was trained over two TPU v4 Pods with 3,072 TPU v4 chips in each Pod attached to 768 hosts, connected using a combination of model and data parallelism , which was the largest TPU configuration. [2] [17] This allowed for efficient training at scale, using 6,144 chips, and marked a record for the highest training efficiency achieved for LLMs at this scale: a hardware FLOPs utilization of 57.8%. [3]

See also

LaMDA , PaLM's predecessor

Gemini , PaLM's successor

Chinchilla

References

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Google

Google Brain

Google DeepMind

AlphaGo (2015)

Master (2016)

AlphaGo Zero (2017)

AlphaZero (2017)

MuZero (2019)

Fan Hui (2015)

Lee Sedol (2016)

Ke Jie (2017)

AlphaGo (2017)

The MANIAC (2023)

AlphaFold (2018)

AlphaStar (2019)

AlphaDev (2023)

AlphaGeometry (2024)

AlphaGenome (2025)

Inception (2014)

WaveNet (2016)

MobileNet (2017)

Transformer (2017)

EfficientNet (2019)

Gato (2022)

Quantum Artificial Intelligence Lab

TensorFlow

Tensor Processing Unit

Assistant (2016)

Sparrow (2022)

Gemini (2023)

BERT (2018)

XLNet (2019)

T5 (2019)

LaMDA (2021)

Chinchilla (2022)
PaLM (2022)
Imagen (2023)
Gemini (2023)
VideoPoet (2024)
Gemma (2024)
Veo (2024)
DreamBooth (2022)
NotebookLM (2023)
Vids (2024)
Gemini Robotics (2025)
" Attention Is All You Need "
Future of Go Summit
Generative pre-trained transformer
Google Labs
Google Pixel
Google Workspace
Robot Constitution
Category
Commons
v
t
e
AI
Area 120
ATAP
Brain
China
Cloud Platform
Energy
Google.org Crisis Response
Crisis Response
Health
Registry
DeepMind
Fitbit
ITA Software
Jigsaw

Looker
Mandiant
Security Operations
Owlchemy Labs
Actifio
Adscape
Akwan Information Technologies
Anvato
Apigee
BandPage
Bitium
BufferBox
Crashlytics
Dodgeball
DoubleClick
Dropcam
Endoxon
Flutter
Global IP Solutions
Green Throttle Games
GreenBorder
Gridcentric
ImageAmerica
Impermium
Invite Media
Kaltix
Marratech
Meebo
Metaweb
Neotonic Software
Neverware
Nik Software
Orbitera
Pyr Labs
Quest Visual
Reqwireless
RightsFlow
Sidewalk Labs

SlickLogin
Titan Aerospace
Typhoon Studios
Urban Engines
Vicarious
Viewdle
Wavii
Wildfire Interactive
YouTube Next Lab and Audience Development Group
Business Groups
Computing University Initiative
Contact Lens
Content ID
CrossCheck
Data Liberation Front
Data Transfer Project
Developer Expert
DigiKavach
DigiPivot
Digital Garage
Digital News Initiative
Digital Unlocked
Dragonfly
Founders' Award
Free Zone
Get Your Business Online
Google for Education
Google for Startups
Living Stories
Made with Code
News Lab
PowerMeter
Privacy Sandbox
Project Nightingale
Project Nimbus
Project Sunroof
Project Zero
Quantum Artificial Intelligence Lab

RechargeIT
Sensorvault
Silicon Initiative
Solve for X
Street View Trusted
Student Ambassador Program
Vevo
YouTube BrandConnect
YouTube Creator Awards
YouTube Select
YouTube Original Channel Initiative
Year in Search
YouTube Rewind 2018 2019
2018
2019
AlphaGo versus Fan Hui
AlphaGo versus Lee Sedol
AlphaGo versus Ke Jie
Android Developer Challenge
Android Developer Day
Android Developer Lab
CNN/YouTube presidential debates
Code-in
Code Jam
Developer Day
Developers Live
Doodle4Google
Future of Go Summit
G-Day
Hash Code
I/O
Lunar X Prize
Mapathon
Science Fair
Summer of Code
World Chess Championship 2024
YouTube Awards
YouTube Comedy Week

YouTube Live
YouTube Music Awards 2013 2015
2013
2015
YouTube Space Lab
YouTube Symphony Orchestra
111 Eighth Avenue
Android lawn statues
Androidland
Barges
Binoculars Building
Central Saint Giles
Chelsea Market
Chrome Zone
Data centers
GeoEye-1
Googleplex
Ivanpah Solar Power Facility
James R. Thompson Center
King's Cross
Mayfield Mall
Pier 57
Sidewalk Toronto
St. John's Terminal
Submarine cables Dunant Grace Hopper Unity
Dunant
Grace Hopper
Unity
WiFi
YouTube Space
YouTube Theater
Krishna Bharat
Vint Cerf
Jeff Dean
John Doerr
Sanjay Ghemawat
Al Gore
John L. Hennessy

Urs Hölzle
Salar Kamangar
Ray Kurzweil
Ann Mather
Alan Mulally
Rick Osterloh
Sundar Pichai (CEO)
Ruth Porat (CFO)
Rajen Sheth
Hal Varian
Neal Mohan
Andy Bechtolsheim
Sergey Brin (co-founder)
David Cheriton
Matt Cutts
David Drummond
Alan Eustace
Timnit Gebru
Omid Kordestani
Paul Otellini
Larry Page (co-founder)
Patrick Pichette
Eric Schmidt
Ram Shriram
Amit Singhal
Shirley M. Tilghman
Rachel Whetstone
Susan Wojcicki
Censorship
DeGoogle
FairSearch
" Google's Ideological Echo Chamber "
No Tech for Apartheid
Privacy concerns Street View YouTube
Street View
YouTube
Trade unions Alphabet Workers Union
Alphabet Workers Union

YouTube copyright issues
Backdoor advertisement controversy
Blocking of YouTube videos in Germany
Data breach
Elsagate
Fantastic Adventures scandal
Kohistan video case
Reactions to Innocence of Muslims
San Francisco tech bus protests
Services outages
Slovenian government incident
Walkouts
YouTube headquarters shooting
Android apps
April Fools' Day jokes
Doodles Doodle Champion Island Games Magic Cat Academy
Doodle Champion Island Games
Magic Cat Academy
Easter eggs
History Gmail Search YouTube
Gmail
Search
YouTube
Logo
Material Design
Mergers and acquisitions
Accelerated Linear Algebra
AMP
Actions on Google
ALTS
American Fuzzy Lop
Android Cloud to Device Messaging
Android Debug Bridge
Android NDK
Android Runtime
Android SDK
Android Studio
Angular

AngularJS
Apache Beam
APIs
App Engine
App Inventor
App Maker
App Runtime for Chrome
AppJet
Apps Script
AppSheet
ARCore
Base
Bazel
BeyondCorp
Bigtable
BigQuery
Bionic
Blockly
Borg
Caja
Cameyo
Chart API
Charts
Chrome Frame
Chromium Blink
Blink
Closure Tools
Cloud Connect
Cloud Dataflow
Cloud Datastore
Cloud Messaging
Cloud Shell
Cloud Storage
Code Search
Compute Engine
Cpplint
Dalvik
Data Protocol

Dialogflow
Exposure Notification
Fast Pair
Fastboot
Federated Learning of Cohorts
File System
Firebase
Firebase Studio
Firebase Cloud Messaging
FlatBuffers
Flutter
Freebase
Gadgets
Ganeti
Gears
Gerrit
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Gson
Guava
Guetzli
Guice
gVisor
GYP
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Kythe
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Lighthouse
Looker Studio
Imctfy
MapReduce
Mashup Editor
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Mobile Services
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Native Client
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Nomulus
Open Location Code
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OpenSocial
Optimize
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PageSpeed
Piper
Plugin for Eclipse
Polymer
Programmable Search Engine
Project Shield
Public DNS
reCAPTCHA
RenderScript
SafetyNet
SageTV
Schema.org
Search Console
Shell
Sitemaps
Skia Graphics Engine
Spanner
Sputnik
Stackdriver
Swiffy
Tango
TensorFlow
Tesseract
Test
Translator Toolkit
Urchin UTM parameters
UTM parameters
V8

VirusTotal

VisBug

Wave Federation Protocol

Weave

Web Accelerator

Web Designer

Web Server

Web Toolkit

Webdriver Torso

WebRTC

Android Cupcake Donut Eclair Froyo Gingerbread Honeycomb Ice Cream Sandwich Jelly Bean
KitKat Lollipop Marshmallow Nougat Oreo Pie 10 11 12 13 14 15 16 version history smartphones

Cupcake

Donut

Eclair

Froyo

Gingerbread

Honeycomb

Ice Cream Sandwich

Jelly Bean

KitKat

Lollipop

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Android Automotive

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Android XR
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Glass OS
gLinux
Goobuntu
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Wear OS
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Gemma
Imagen (2023)
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Veo (text-to-video model)
VideoPoet
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MobileNet
Transformer
WaveNet
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AlphaGeometry
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Lyra
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Ultra HDR
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WebP
WOFF2
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Dart
Go
Sawzall
Googlebot
Hummingbird
Mobilegeddon
PageRank matrix
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Panda
Penguin
Pigeon
RankBrain
.app
.dev
.google
.zip
g.co
google.by
Croscore

Noto
Product Sans
Roboto
Aardvark
Account Dashboard Takeout
Dashboard
Takeout
Ad Manager
AdMob
Ads
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Affiliate Network
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Allo
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Android Auto
Android Beam
Answers
Apture
Arts & Culture
Assistant
Attribution
Authenticator
BebaPay
BeatThatQuote.com
Beam
Blog Search
Blogger
Body
Bookmarks
Books Ngram Viewer
Ngram Viewer
Browser Sync
Building Maker
Bump
BumpTop
Buzz
Calendar

Cast
Catalogs
Chat
Checkout
Chrome
Chrome Apps
Chrome Experiments
Chrome Remote Desktop
Chrome Web Store
Classroom
Cloud Print
Cloud Search
Contacts
Contributor
Crowdsourcing
Currents (social app)
Currents (news app)
Data Commons
Dataset Search
Desktop
Dictionary
Dinosaur Game
Directory
Docs
Docs Editors
Domains
Drawings
Drive
Duo
Earth
Etherpad
Expeditions
Express
Family Link
Fast Flip
FeedBurner
fflick
Fi Wireless

Finance
Files
Find Hub
Fit
Flights
Flu Trends
Fonts
Forms
Friend Connect
Fusion Tables
Gboard
Gemini
Gesture Search
Gizmo5
Google+
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Goggles
GOOG-411
Grasshopper
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Images Image Labeler
Image Labeler
Image Swirl
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Input Tools Japanese Input Pinyin
Japanese Input
Pinyin
Insights for Search
Jaiku
Jamboard
Kaggle
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Labs
Latitude

Lens
Like.com
Live Transcribe
Lively
Map Maker
Maps
Maps Navigation
Marketing Platform
Meet
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My Tracks
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News & Weather
News Archive
Notebook
NotebookLM
Now
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One
One Pass
Opinion Rewards
Orkut
Oyster
Panoramio
PaperofRecord.com
Patents
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Pay (mobile app)
Pay (payment method)
Pay Send
People Cards
Person Finder
Personalized Search
Photomath
Photos
Picasa

Picasa Web Albums
Picnik
Pixel Camera
Play
Play Books
Play Games
Play Music
Play Newsstand
Play Pass
Play Services
Podcasts
Poly
Postini
PostRank
Primer
Public Alerts
Public Data Explorer
Question Hub
Quick, Draw!
Quick Search Box
Quick Share
Quickoffice
Read Along
Reader
Reply
Safe Browsing
SageTV
Santa Tracker
Schemer
Scholar
Search AI Overviews Knowledge Graph SafeSearch
AI Overviews
Knowledge Graph
SafeSearch
Searchwiki
Sheets
Shoploop
Shopping

Sidewiki
Sites
Slides
Snapseed
Socratic
Softcard
Songza
Sound Amplifier
Spaces
Sparrow (chatbot)
Sparrow (email client)
Speech Recognition & Synthesis
Squared
Stadia
Station
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Tenor
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Toontastic 3D
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Voice
Voice Access

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Wallet
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WDYL
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Wiz
Word Lens
Workspace
Workspace Marketplace
YouTube
YouTube Kids
YouTube Music
YouTube Premium
YouTube Shorts
YouTube Studio
YouTube TV
YouTube VR
Pixel (2016)
Pixel 2 (2017)
Pixel 3 (2018)
Pixel 3a (2019)
Pixel 4 (2019)
Pixel 4a (2020)
Pixel 5 (2020)
Pixel 5a (2021)
Pixel 6 (2021)
Pixel 6a (2022)
Pixel 7 (2022)
Pixel 7a (2023)
Pixel Fold (2023)
Pixel 8 (2023)
Pixel 8a (2024)
Pixel 9 (2024)
Pixel 9 Pro Fold (2024)
Pixel 9a (2025)

Pixel 10 (2025)
Pixel 10 Pro Fold (2025)
Pixel Watch (2022)
Pixel Watch 2 (2023)
Pixel Watch 3 (2024)
Pixel Watch 4 (2025)
Pixel C (2015)
Pixel Slate (2018)
Pixel Tablet (2023)
Chromebook Pixel (2013–2015)
Pixelbook (2017)
Pixelbook Go (2019)
Pixel Buds (2017–present)
Nexus One (2010)
Nexus S (2010)
Galaxy Nexus (2011)
Nexus 4 (2012)
Nexus 5 (2013)
Nexus 6 (2014)
Nexus 5X (2015)
Nexus 6P (2015)
Nexus 7 (2012)
Nexus 10 (2012)
Nexus 7 (2013)
Nexus 9 (2014)
Nexus Q (2012)
Nexus Player (2014)
Android Dev Phone
Android One
Cardboard
Chromebit
Chromebook
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Clips
Daydream
Fitbit
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Liftware

Liquid Galaxy

Nest smart speakers Thermostat Wifi

smart speakers

Thermostat

Wifi

Play Edition

Project Ara

OnHub

Pixel Visual Core

Project Iris

Search Appliance

Sycamore processor

Tensor

Tensor Processing Unit

Titan Security Key

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e

Feldman v. Google, Inc. (2007)

Rescuecom Corp. v. Google Inc. (2009)

Goddard v. Google, Inc. (2009)

Rosetta Stone Ltd. v. Google, Inc. (2012)

Google, Inc. v. American Blind & Wallpaper Factory, Inc. (2017)

Jedi Blue

European Union (2010–present)

United States v. Adobe Systems, Inc., Apple Inc., Google Inc., Intel Corporation, Intuit, Inc., and Pixar (2011)

Umar Javeed, Sukarma Thapar, Aaqib Javeed vs. Google LLC and Ors. (2019)

United States v. Google LLC (2020)

United States v. Google LLC (2023)

Perfect 10, Inc. v. Amazon.com, Inc. (2007)

Viacom International, Inc. v. YouTube, Inc. (2010)

Lenz v. Universal Music Corp. (2015)

Authors Guild, Inc. v. Google, Inc. (2015)

Field v. Google, Inc. (2016)

Google LLC v. Oracle America, Inc. (2021)

Smartphone patent wars

Rocky Mountain Bank v. Google, Inc. (2009)
Hibnick v. Google, Inc. (2010)
United States v. Google Inc. (2012)
Judgement of the German Federal Court of Justice on Google's autocomplete function (2013)
Joffe v. Google, Inc. (2013)
Mosley v SARL Google (2013)
Google Spain v AEPD and Mario Costeja González (2014)
Frank v. Gaos (2019)
Garcia v. Google, Inc. (2015)
Google LLC v Defteros (2020)
Epic Games v. Google (2021)
Gonzalez v. Google LLC (2022)
Beauty YouTuber
BookTube
BreadTube
" Don't be evil "
Gayglers
Google as a verb
Google bombing 2004 U.S. presidential election
2004 U.S. presidential election
Google effect
Googlefight
Google hacking
Googleshare
Google tax
Googlewhack
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VTuber
YouTube Poop
YouTuber list

list

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Recovery mode

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Antarctica

Asia Israel

Israel

Europe

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Canada

United States

Oceania

South America Argentina Chile Colombia

Argentina

Chile

Colombia

Copyright strike

Education

Features

Moderation

Most-disliked videos

Most-liked videos

Most-subscribed channels

Most-viewed channels

Most-viewed videos Arabic music videos Chinese music videos French music videos Indian videos Pakistani videos

Arabic music videos

Chinese music videos

French music videos

Indian videos

Pakistani videos

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Social impact

YouTube Premium original programming

Gmail interface

Maps pin
Most downloaded Google Play applications
Stadia games
AlphaGo
Google: Behind the Screen
Google Maps Road Trip
Google and the World Brain
The Creepy Line
Google Hacks
The Google Story
Googled: The End of the World as We Know It
How Google Works
I'm Feeling Lucky
In the Plex
The MANIAC
Google Feud
Google Me (film)
" Google Me " (Kim Zolciak song)
" Google Me " (Teyana Taylor song)
Is Google Making Us Stupid?
Proceratium google
Matt Nathanson: Live at Google
The Billion Dollar Code
The Internship
Where on Google Earth is Carmen Sandiego?
" Attention Is All You Need "
elgooG
Generative pre-trained transformer
" Me at the zoo "
Predictions of the end
Relationship with Wikipedia
" Reunion "
Robot Constitution
Category
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Companies
Projects
Parameter Hyperparameter
Hyperparameter
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Regression Bias–variance tradeoff Double descent Overfitting
Bias–variance tradeoff
Double descent
Overfitting
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Gradient descent SGD Quasi-Newton method Conjugate gradient method
SGD
Quasi-Newton method
Conjugate gradient method
Backpropagation
Attention
Convolution
Normalization Batchnorm
Batchnorm
Activation Softmax Sigmoid Rectifier
Softmax
Sigmoid
Rectifier
Gating
Weight initialization
Regularization
Datasets Augmentation
Augmentation
Prompt engineering
Reinforcement learning Q-learning SARSA Imitation Policy gradient
Q-learning
SARSA
Imitation
Policy gradient
Diffusion
Latent diffusion model

Autoregression
Adversary
RAG
Uncanny valley
RLHF
Self-supervised learning
Reflection
Recursive self-improvement
Hallucination
Word embedding
Vibe coding
Machine learning In-context learning
In-context learning
Artificial neural network Deep learning
Deep learning
Language model Large language model NMT
Large language model
NMT
Reasoning language model
Model Context Protocol
Intelligent agent
Artificial human companion
Humanity's Last Exam
Artificial general intelligence (AGI)
AlexNet
WaveNet
Human image synthesis
HWR
OCR
Computer vision
Speech synthesis 15.ai ElevenLabs
15.ai
ElevenLabs
Speech recognition Whisper
Whisper
Facial recognition
AlphaFold

Text-to-image models Aurora DALL-E Firefly Flux Ideogram Imagen Midjourney Recraft Stable Diffusion

Aurora

DALL-E

Firefly

Flux

Ideogram

Imagen

Midjourney

Recraft

Stable Diffusion

Text-to-video models Dream Machine Runway Gen Hailuo AI Kling Sora Veo

Dream Machine

Runway Gen

Hailuo AI

Kling

Sora

Veo

Music generation Riffusion Suno AI Udio

Riffusion

Suno AI

Udio

Word2vec

Seq2seq

GloVe

BERT

T5

Llama

Chinchilla AI

PaLM

GPT 1 2 3 J ChatGPT 4 4o o1 o3 4.5 4.1 o4-mini 5

1

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J

ChatGPT

4

4o

o1

o3

4.5

4.1

o4-mini

5

Claude

Gemini Gemini (language model) Gemma

Gemini (language model)

Gemma

Grok

LaMDA

BLOOM

DBRX

Project Debater

IBM Watson

IBM Watsonx

Granite

PanGu- Σ

DeepSeek

Qwen

AlphaGo

AlphaZero

OpenAI Five

Self-driving car

MuZero

Action selection AutoGPT

AutoGPT

Robot control

Alan Turing

Warren Sturgis McCulloch

Walter Pitts

John von Neumann

Claude Shannon

Shun'ichi Amari

Kunihiko Fukushima

Takeo Kanade

Marvin Minsky

John McCarthy
Nathaniel Rochester
Allen Newell
Cliff Shaw
Herbert A. Simon
Oliver Selfridge
Frank Rosenblatt
Bernard Widrow
Joseph Weizenbaum
Seymour Papert
Seppo Linnainmaa
Paul Werbos
Geoffrey Hinton
John Hopfield
Jürgen Schmidhuber
Yann LeCun
Yoshua Bengio
Lotfi A. Zadeh
Stephen Grossberg
Alex Graves
James Goodnight
Andrew Ng
Fei-Fei Li
Alex Krizhevsky
Ilya Sutskever
Oriol Vinyals
Quoc V. Le
Ian Goodfellow
Demis Hassabis
David Silver
Andrej Karpathy
Ashish Vaswani
Noam Shazeer
Aidan Gomez
John Schulman
Mustafa Suleyman
Jan Leike
Daniel Kokotajlo

François Chollet
Neural Turing machine
Differentiable neural computer
Transformer Vision transformer (ViT)
Vision transformer (ViT)
Recurrent neural network (RNN)
Long short-term memory (LSTM)
Gated recurrent unit (GRU)
Echo state network
Multilayer perceptron (MLP)
Convolutional neural network (CNN)
Residual neural network (RNN)
Highway network
Mamba
Autoencoder
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Generative adversarial network (GAN)
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Bigram
Trigram
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Natural language understanding
Stop words
Text processing
Argument mining
Collocation extraction
Concept mining
Coreference resolution
Deep linguistic processing
Distant reading
Information extraction

Named-entity recognition
Ontology learning
Parsing Semantic parsing Syntactic parsing
Semantic parsing
Syntactic parsing
Part-of-speech tagging
Semantic analysis
Semantic role labeling
Semantic decomposition
Semantic similarity
Sentiment analysis
Terminology extraction
Text mining
Textual entailment
Truecasing
Word-sense disambiguation
Word-sense induction
Compound-term processing
Lemmatisation
Lexical analysis
Text chunking
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Sentence segmentation
Word segmentation
Multi-document summarization
Sentence extraction
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Explicit semantic analysis
fastText
GloVe

Language model (large)
Latent semantic analysis
Seq2seq
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Lexical resource
Linguistic Linked Open Data
Machine-readable dictionary
Parallel text
PropBank
Semantic network
Simple Knowledge Organization System
Speech corpus
Text corpus
Thesaurus (information retrieval)
Treebank
Universal Dependencies
BabelNet
Bank of English
DBpedia
FrameNet
Google Ngram Viewer
UBY
WordNet
Wikidata
Speech recognition
Speech segmentation
Speech synthesis
Natural language generation
Optical character recognition
Document classification
Latent Dirichlet allocation
Pachinko allocation
Automated essay scoring
Concordancer
Grammar checker
Predictive text

Pronunciation assessment

Spell checker

Chatbot

Interactive fiction

Question answering

Virtual assistant

Voice user interface

Formal semantics

Hallucination

Natural Language Toolkit

spaCy