Artificial Intelligence Generic Capabilities

Basic Predictions

Regression

Regression techniques aim to predict the value of one or more dependent variables based on the values of one or more predictor variables.

Classification

Classification assigns categorical labels to data points. Unsupervised classification where the classes are neither named nor known beforehand is known as clustering.

Anomaly Detection

Anomaly detection is used to identify data points that differ from the expected patterns. It is typically used for outlier detection, fraud detection or error detection.

Generation

Text Generation & Completion

Text Generation and Completion produces coherent and contextually relevant text based on a given input or prompt.

Image Generation

Image Generation is the process where AI creates new images from textual descriptions, sketches, or other inputs.

Video Generation

Video Generation refers to the production of dynamic video content by AI, based on input like text, images, or other data.

Audio Generation

Audio Generation involves the creation of synthetic audio, such as speech, music, or sound effects. It is applied in voice assistants, entertainment, and accessibility tools.

Code Generation

Code Generation refers to the automated creation of programming code, e.g. through auto-completion or generation of code snippets based on instructions.

Synthetic Data Generation

This describes the process of creating artificial data that mimics real-world data in order to train AI models while preserving privacy limitations.

Image, Video & Sound Processing

Optical Character Recognition

Optical character recognition is used to transform images from printed or handwritten text into machine-processable text.

Image Description & Analysis

Image Description and Analysis refers to the process of interpreting visual content to extract insights or generate textual descriptions.

Facial Recognition

Facial Recognition detects faces in pictures or videos. It may also include identification and authentication by ascribing them to known persons.

Gesture Recognition

Gesture recognition interprets human gestures, i.e. body movements. This mostly involves hand movements and changes in facial expressions.

Speech Recognition

Speech recognition converts spoken language into machine-processable representations.

Object Recognition & Tracking

This involves first identifying and then continuously monitoring objects within images or video streams.

Recommendation & Filtering

Information Filtering

Information filtering splits up available information into relevant information and unwanted or useless information, thereby avoiding information overload

Collaborative Recommendation

Collaborative recommendations involve deriving personal preferences based on information from a peer group.

Content-Based Recommendation

Content-based recommendation relates the properties of the candidates with the current context or individual preferences of a user.

Text Processing

Text Summarization

Automatic text summarization determines the essential information of textual data and transform it into a condensed form.

Translation

Translation refers to the conversion of text or speech from one language to another by AI systems.

Question Answering

Question Answering is the process where an AI system provides precise and relevant answers to user queries based on input text or a given dataset.

Sentiment Analysis

Sentiment Analysis is the process of identifying and categorizing emotions or opinions expressed in text.

Information Extraction

Information Extraction involves identifying and extracting structured information from unstructured input, such as dates, entities, relationships, and events.

Knowledge Management

Data Mining

Data mining is the recognition of patterns and relationships in large, mostly unstructured data sets.

Semantic Search

Semantic Search improves search accuracy by identifying relevant information based on the meaning and context of a query rather than exact keyword matching.

Knowledge Representation

Knowledge representation prepares and presents information in a form that can be used by humans or computers to solve further tasks based on it.

Graph Creation

Graph Creation involves building structured representations of information in the form of nodes and edges to navigate knowledge in complex systems.

Task Planning

Automated Planning

Automated planning is used to identify sequences of actions to solve complex problems.

Strategic Planning

Strategic planning describes the process of making decisions or defining goals based on assumptions about future developments.

Competition Planning

Competition planning deals with the planning of potential actions in a game-theoretical manner, taking into account competing or cooperating actors in the same environment.

Task Execution

Virtual Assistance

A virtual assistant provides direct, situational assistance to a user performing everyday tasks, taking into account individual needs and the current context.

Autonomous Agents

This is an entity that perceives its current context and aligns the captured data with the tasks assigned to it, in order to make decisions and independently perform actions.

Voice Control

Voice control identifies the intention of a voice command in order to trigger an action.

Non-linear Control

Non-linear control is applied in settings with a complex interdependence of input and output. It utilizes feedback loops to adjust the input based on the observed intermediate output.

Robotic Process Automation

Robotic process automation involves automating tasks by replacing user-interface-based interactions with bots.

Other

Explainable AI

Explainable AI refers to methods that make outputs of AI systems understandable to humans. It provides transparency in how AI models function, helping interpret the results.

Source: https://machinelearningcatalogue.com