Artifical 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 & Image 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 & Object 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 other competing or cooperating actors operating in the same context.

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