

ENTRY ARTIFICIAL INTELLIGENCE

[ENTRY ARTIFICIAL INTELLIGENCE] Authors: Oliver Knill: March 2000 Literature: Peter Norvig, Paradigms of Artificial Intelligence Programming Daniel Juravsky and James Martin, Speech and Language Processing

Adaptive Simulated Annealing

[Adaptive Simulated Annealing] A language interface to a neural net simulator.

artificial intelligence

[artificial intelligence] (AI) is a field of computer science concerned with the concepts and methods of symbolic knowledge representation. AI attempts to model aspects of human thought on computers. Aspects of AI:

- computer vision
- language processing
- pattern recognition
- expert systems
- problem solving
- roboting
- optical character recognition
- artificial life
- grammars
- game theory

Babelfish

[Babelfish] Online translation system from Systran.

Chomsky

[Chomsky] Noam Chomsky is a pioneer in formal language theory. He is MIT Professor of Linguistics, Linguistic Theory, Syntax, Semantics and Philosophy of Language.

Eliza

[Eliza] One of the first programs to feature English output as well as input. It was developed by Joseph Weizenbaum at MIT. The paper appears in the January 1966 issue of the "Communications of the Association of Computing Machinery".

Google

[Google] A search engine emerging at the end of the 20'th century. It has AI features, allows not only to answer questions by pointing to relevant webpages but can also do simple tasks like doing arithmetic computations, convert units, read the news or find pictures with some content.

GPS

[GPS] General Problem Solver. A program developed in 1957 by Alan Newell and Herbert Simon. The aim was to write a single computer program which could solve any problem. One reason why GPS was destined to fail is now at the core of computer science. There are a large set of problems which are NP hard and where finding a solution becomes exponentially hard in dependence of the size of the problem. Nonetheless, GPS has been a useful tool for exploring AI programming.

HAL

[HAL] The HAL 9000 computer was the main character in Stanley Kurbriick's film 2001: a Space Odyssey. HAL is an AI agent capable to understand advanced language processing behavior as speaking and understanding language and even reading lips.

Lisp

[Lisp] Lisp is one of the oldest programming languages still in widespread use today. "Common Lisp" is the most widely accepted standard. Other dialects like "Franz Lisp" MacLisp, InterLisp, ZetaLisp or "Standard Lisp" are considered obsolete. Lisp is the most popular language for AI programming. Lisp programs are concise and are uncluttered by low-level detail.

Loebner Prize

[Loebner Prize] A competition attempted to put various computer programs to the Turing test. A consistent result over the years has been that even the crudest programs can fool some of the judges some of the time.

MIT ai lab

[MIT ai lab] Massachusetts Institute of Technology AI laboratory.

neural network

[neural network] Artificial neural networks try to simulate biological neural networks as found in the brain. Such a network consists of many simple processors called neurons, each possibly having some local memory. These neurons are connected and evolve depending to their local data and on the inputs they receive via the connections. A neural network can either be an algorithm, or be realized as actual hardware. Neural networks typically allow training. They learn by adjusting the weights of the connections on the basis of presented patterns. The individual neurons are elementary non-linear signal processors. Neural networks are distinguished from other computing devices by a high degree of interconnection allowing parallelism. There is no idle memory containing data and programs. Each neuron is pre-programmed and continuously active.

pattern recognition

[pattern recognition] A branch of artificial intelligence concerned with the classification or description of observations. The classification uses either statistical, syntactic or neural aproches.

pilot

[pilot] Programmed Inquiry Learning Or Teaching.

prolog

[prolog] A popular AI programming language used in Europe and Japan. Prolog shares most of Lisp's advantages in terms of flexibility and conciseness.

regular expression

[regular expression] is a language for specifying text search strings. It is used in UNIX programs like vi, perl, emacs or grep. It is also used in Microsoft word or web search engines.

scheme

[scheme] A dialect of Lisp which is gaining popularity, primarily for teaching and experimenting with programming language design and techniques.

Shrdlu

[Shrdlu] Terry Winograd's SHRDLU system of 1972 simulated a robot embedded in a world of toy blocks. The program was able to accept natural language text commands.

Student

[Student] Student was an early language understanding program written by Daniel Bubrow in 1964. It was designed to read and solve the kind of word problems found in high school algebra books. Unlike Eliza, "Student" must process and understand a great deal of input as well as be able to solve algebraic equations.

toy problem

[toy problem] A deliberately oversimplified case of a challenging problem used to investigate, prototype, or test algorithms for a real problem.

Turing test

[Turing test] A test introduced in 1950 by Alan Turing. There are three participants. Two people and a computer. One person plays the role of an interrogator who has to find out, which of the two others is a machine. This interrogator is connected to the two other participants through teletype. The task of the machine is to fool the interrogator into believing it is a person. The task of the other participant is to convince the interrogator that he is human. Turing predicted that in 2000 a machine with 10 Gig memory would have a 30 percent change of fooling a human interrogator after 5 minutes of questioning.

Weizenbaum

[Weizenbaum] Joseph Weizenbaum was the principal developer of Eliza, one of the first programs to feature English output as well as input.

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Index

Adaptive Simulated Annealing, 1

artificial intelligence, 1

Babelfish, 1

Chomsky, 1

Eliza, 1

Google, 2

GPS, 2

HAL, 2

Lisp, 2

Loebner Prize, 2

MIT ai lab, 2

neural network, 3

pattern recognition, 3

pilot, 3

prolog, 3

regular expression, 3

scheme, 3

Shrdlu, 3

Student, 4

toy problem, 4

Turing test, 4

Weizenbaum, 4