4 RULE BASED AI

PJD's opening remarks

The earliest mathematical models for computers were developed in the 1930s. The Turing machine is the most famous.

All these early conceptions expressed the algorithms that controlled the machines as a series of rules to be followed at each step.

Much of what we call programming today is inherited from those conceptions. Programmers use synthetic languages to express the rules of algorithms and a compiler translates them into machine codes.

The earliest AI programs sought to automate human thought processes of problem-solving, which were seen as applications of logic combined with numerical calculations. It was natural to seek expressions of intelligent functions as sets of rules.

A number of computer languages were invented to facilitate the programming of such machines. LISP and PROLOG are two famous examples.

Board games were among the first targets of these machines. It was commonly said that if a computer could play checkers or chess, it would have to be intelligent. The first checkers machine came in 1952 by Arthur Samuels of IBM. Others followed by building chess machines, a long movement that finally resulted in the IBM Deep Blue computer that beat chess grandmaster Garry Kasparov in 1997. These machines relied on advanced search algorithms that located advantageous board positions, but were not intelligent.

The most ambitious kind of these machines was the expert system, which would contain all the rules followed by a human expert and would solve problems that only experts could solve.

Dr Vinnie Monaco is here today to discuss these kinds of machines and give you a glimpse of some of the AI problems they are good for, and also are not good for. He joined our faculty one year ago. He received his BS and PhD from Pace University in New York. He worked at the Army at Aberdeen Proving Ground for 2 years before joining NPS. His Army research focused on brain-inspired computer architectures to solve tasks traditional computers are not suited for. He continues that line of research at NPS with neuromorphic computing, a blend of computer architectures, machine learning, and neuroscience.