Jacques Pitrat (1934-2019): An Obituary

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Jacques Pitrat passed away on the 14th of October 2019. He was a pioneer of Artificial Intelligence in France. He liked to say he was the first to translate the name to 'Intelligence Artificielle' in french.

He was a Director of Research at CNRS and LIP6. He studied at École Polytechnique and started a thesis on Artificial Intelligence in 1960. The topic was about a system proving theorems using heuristic methods. He was a CNRS researcher from 1967 to 2000 and continued to do research after his retirement. He gave Artificial Intelligence courses at Sorbonne University from 1967 to 1998. He directed 70 PhD thesis.

He was fellow of the Association for the Advancement of Artificial Intelligence (AAAI), of the European Coordinating Committee for Artificial Intelligence (ECCAI), and member of honour of AFIA (Association Française pour l'Intelligence Artificielle).

Jacques Pitrat was among the first to explore multiple domains of Artificial Intelligence. He proposed original and innovative approaches to Artificial Intelligence, starting with General Game Playing, publishing the founding paper of the domain (Pitrat, 1968) and programming the first General Game Playing system. He was particularly interested in creating general systems that could be applied to multiple problems, which is a founding goal of Artificial Intelligence.

During the seventies he worked on Chess programs developing plans to find combinations (Pitrat, 1977) or learning to find combinations using the explanations of the program (Pitrat, 1976). His

Fig. 1. Jacques Pitrat in 2014

approach to machine learning was to use the rules of the games to reason on the new combinations found by the system so as to generalize them in a safe way and to create new safe rules. He was a supporter of systems using heuristics and knowledge to reduce the exploration of the state space rather than brute force. He was close to Herbert Simon and keep corresponding with him until his death.

Jacques Pitrat also contributed to the birth of Constraint Programming with Jean-Louis Laurière, again using methods that reduced possible choices with reasoning, heuristics and knowledge so as to improve the search for solutions. He worked on Natural Language Processing as well. He liked to give his students as an exercise a lexicographic generator and analyzer so as to test their ability to produce general programs. He unified all these domains working on metaknowledge, the knowledge about knowledge. So as to experiment with metaknowledge he wrote the MACISTE system a general problem solver using metaknowledge. He also wrote the MALICE system, the descendant of Jean-Louis Laurière constraint programming system Alice, using metaknowledge to optimize constraint problem solving.

Jacques Pitrat worked for many years on the bootstrapping of Artificial Intelligence with the CAIA system (Pitrat, 2013), an artificial researcher in Artificial Intelligence. He was convinced that human intelligence had to be helped by Artificial Intelligence to improve Artificial Intelligence systems so as to make them more intelligent than humans.

He liked to program and spent a lot of time experimenting with his systems and improving them.

He defended until his death his vision of strong Artificial Intelligence, an Artificial Intelligence which would be better than human intelligence in all domains.

He directed many PhD thesis on Artificial Intelligence in games, including four thesis on the game of Go. My own PhD thesis with him as director was about a system learning rules in the game of Go. The rules were theorems of the game enabling to safely eliminate irrelevant moves and to accelerate tactical problem solving. The learning principle was to use the auto-observation of the system by itself in order to analyze its own reasoning so as to create new rules. The generalization of the rules was safe as it used the rules of the games in first order logic to transform instantiated rules in rules with variables. I very much appreciated being his PhD student, my PhD was interesting, challenging and full of accomplishment. I particularly remember with joy the nightly confrontations of my Go program with Bruno Bouzy's INDIGO program as Bruno was also doing his PhD with Jacques Pitrat on Go.

His original ideas of General Game Playing and of bootstrapping Artificial Intelligence deeply influenced my research. For example my initial motivation for creating Nested Monte Carlo Search was to bootstrap Monte Carlo search, i.e. to use Monte Carlo Search to improve Monte Carlo Search. If we analyze the evolution of recent game research such as ALPHA ZERO or POLYGAMES to the light of the original ideas of Jacques Pitrat (Pitrat, 1998), we can see that bootstrapping the policy and the value and that general game systems which are strong for many games and better than specialized systems are very relevant to the current research on games. He had a long term vision of the evolution of Artificial Intelligence.

Jacques Pitrat was a charming, kind, caring and brilliant man who had an immense passion for Artificial Intelligence. He knew how to communicate his passion to other people and he was an endless source of inspiration and motivation for all the researchers and the students who were lucky enough to meet him.

This is with deep sadness that I honour him.

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