

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

1 approach to machine learning was to use the rules of the games to reason on the new combinations 1
2 found by the system so as to generalize them in a safe way and to create new safe rules. He was a 2
3 supporter of systems using heuristics and knowledge to reduce the exploration of the state space rather 3
4 than brute force. He was close to Herbert Simon and keep corresponding with him until his death. 4

5 Jacques Pitrat also contributed to the birth of Constraint Programming with Jean-Louis Laurière, 5
6 again using methods that reduced possible choices with reasoning, heuristics and knowledge so as 6
7 to improve the search for solutions. He worked on Natural Language Processing as well. He liked to 7
8 give his students as an exercise a lexicographic generator and analyzer so as to test their ability to 8
9 produce general programs. He unified all these domains working on metaknowledge, the knowledge 9
10 about knowledge. So as to experiment with metaknowledge he wrote the MACISTE system a general 10
11 problem solver using metaknowledge. He also wrote the MALICE system, the descendant of Jean- 11
12 Louis Laurière constraint programming system Alice, using metaknowledge to optimize constraint 12
13 problem solving. 13
14

15 Jacques Pitrat worked for many years on the bootstrapping of Artificial Intelligence with the CAIA 15
16 system (Pitrat, 2013), an artificial researcher in Artificial Intelligence. He was convinced that human 16
17 intelligence had to be helped by Artificial Intelligence to improve Artificial Intelligence systems so as 17
18 to make them more intelligent than humans. 18
19

20 He liked to program and spent a lot of time experimenting with his systems and improving them. 20

21 He defended until his death his vision of strong Artificial Intelligence, an Artificial Intelligence which 21
22 would be better than human intelligence in all domains. 22
23

24 He directed many PhD thesis on Artificial Intelligence in games, including four thesis on the game of 24
25 Go. My own PhD thesis with him as director was about a system learning rules in the game of Go. 25
26 The rules were theorems of the game enabling to safely eliminate irrelevant moves and to accelerate 26
27 tactical problem solving. The learning principle was to use the auto-observation of the system by 27
28 itself in order to analyze its own reasoning so as to create new rules. The generalization of the rules 28
29 was safe as it used the rules of the games in first order logic to transform instantiated rules in rules 29
30 with variables. I very much appreciated being his PhD student, my PhD was interesting, challenging 30
31 and full of accomplishment. I particularly remember with joy the nightly confrontations of my Go 31
32 program with Bruno Bouzy's INDIGO program as Bruno was also doing his PhD with Jacques Pitrat 32
33 on Go. 33
34

35 His original ideas of General Game Playing and of bootstrapping Artificial Intelligence deeply influ- 35
36 enced my research. For example my initial motivation for creating Nested Monte Carlo Search was 36
37 to bootstrap Monte Carlo search, i.e. to use Monte Carlo Search to improve Monte Carlo Search. If 37
38 we analyze the evolution of recent game research such as ALPHA ZERO or POLYGAMES to the light 38
39 of the original ideas of Jacques Pitrat (Pitrat, 1998), we can see that bootstrapping the policy and the 39
40 value and that general game systems which are strong for many games and better than specialized 40
41 systems are very relevant to the current research on games. He had a long term vision of the evolution 41
42 of Artificial Intelligence. 42

43 Jacques Pitrat was a charming, kind, caring and brilliant man who had an immense passion for Arti- 43
44 ficial Intelligence. He knew how to communicate his passion to other people and he was an endless 44
45 source of inspiration and motivation for all the researchers and the students who were lucky enough 45
46 to meet him. 46
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48 This is with deep sadness that I honour him. 48

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