

Robots With AI: A Retrospective on the AAAI Robot Competitions and Exhibitions

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There have been five years of robot competitions and exhibitions since the inception of this annual event in 1992. Since that first show we have seen 30 different teams compete and almost that many more exhibit their robots. These teams ranged from universities to industry and government research labs to one or two inventors working out of garages. Their composition ranged from seasoned AI researchers to eager undergraduates, and they hailed from the United States, Canada, Europe and the Far East. Despite the concerns of some about the relevance and even the appropriateness of such an event, the robots have become a key attraction of the national and international conferences. In this talk, we look back on the form and function of the five years of exhibitions and competitions and attempt to draw some lessons in retrospect as well as future implications for the AI community and our society at large.

A cornerstone of this event has always been the emphasis on fully autonomous robots, and hence the apparent need for AI. We will survey the role that the hallmarks of AI -- planning, learning, machine vision and spoken language understanding -- have played in the competitions, particularly with those teams ranked high in the standings. We will touch on the use of single and multiple agents, reactive and deliberative control schemes, use of active perception, and the basic problem-solving approaches brought to bear each year by the teams in the competition.

The past five years have also seen an increase in the need for and even the use of autonomous mobile robots in the service industries -- those industries requiring the use of robots in natural environments among humans. We are beginning to see the almost routine use of autonomous robots vacuuming large warehouse and hotel areas, ferrying x-rays and medicines in hospitals, and even filling pharmaceutical prescriptions. We will sample from the competition results and some of the exhibitions to suggest which AI technologies can or cannot be made relevant for service industry needs.

Finally, we want to convey some of the atmosphere of the competitions both in front of and behind the scenes: the camaraderie, the sleepless nights, the sharing of ideas, the last minute requisitions for hardware and the up to the minute software hacks. There is every much a thrill of victory and an agony of defeat in these events as there are in sports contests in other settings. Through the liberal use of video tape and anecdotes, we hope we can make these aspects of the competition realizable so that listeners can glimpse the intangible benefits of this important coming together of people and ideas to produce intelligent -- and useful -- robots.