

Manuela M. Veloso

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Academic Positions

- 07/06 - present **Herbert A. Simon Professor**, Computer Science Department, Carnegie Mellon University
Courtesy Professor, Robotics Institute, Machine Learning Department, Electrical and Computer Engineering Department, and Mechanical Engineering Department, Carnegie Mellon University
- 08/06 - 07/07 - **Sargent-Faulfellow**, Radcliffe Institute for Advanced Study, Harvard University, sabbatical leave
- 07/02 - 06/06 **Professor**, Computer Science Department, Carnegie Mellon University
- 07/97 - 07/02 **Associate Professor**, Computer Science Department, Carnegie Mellon University
- 08/99 - 08/00 **Visiting Associate Professor**, Electrical Engineering and Computer Science Department, AI Lab, Massachusetts Institute of Technology, sabbatical leave
- 09/92 - 06/97 **Assistant Professor** Computer Science Department, Carnegie Mellon University
- 08/87 - 08/92 Research Assistant, Computer Science Department, Carnegie Mellon University
- 01/85 - 07/86 Teaching Assistant/Lecturer, Computer Science Department, Boston University
- 10/80 - 07/84 Teaching Assistant/Lecturer, Department of Electrical and Computer Engineering, Instituto Superior Técnico, Lisbon, Portugal

Education

- 1992 **Ph.D. in Computer Science**
School of Computer Science, Carnegie Mellon University, Pittsburgh
- 1986 M.A. in Computer Science
Computer Science Department, Boston University, Boston
- 1984 M.Sc. in Electrical and Computer Engineering
Electrical and Computer Engineering Department,
Instituto Superior Técnico, Lisbon, Portugal
- 1980 Licenciatura in Electrical Engineering
Electrical and Computer Engineering Department,
Instituto Superior Técnico, Lisbon, Portugal

Honors

Chairs

- **Herbert A. Simon Chair**, since 2006.
- **Einstein Chair Professor**, 2012, awarded by the Chinese Academy of Sciences.
(see http://en.cs.ustc.edu.cn/news_8/201201/t20120161_128841.html)
- **Finmeccanica Junior Faculty Chair**, 1994-1997.

Research Awards

- **AAAS Fellow**, the American Association for the Advancement of Science, elected December 2010.
- **IEEE Fellow**, the Institute of Electrical and Electronics Engineers, elected November 2010.
- **The 2009/10 Distinguished Alumna Award**. Boston University, Department of Computer Science.

- **The 2009 ACM/SIGART Autonomous Agents Research Award.** with citation: *“The selection committee for the ACM/SIGART Autonomous Agents Research Award is pleased to announce that Prof. Manuela M. Veloso of Carnegie Mellon University is the recipient of the 2009 award. Prof. Veloso has made significant and sustained contributions to Autonomous Agents and Multiagent Systems in the areas of planning and control learning in multi-agent systems. Prof. Veloso’s research is particularly noteworthy for its focus on the effective construction of teams of robot agents where cognition, perception, and action are seamlessly integrated to address planning, execution, and learning tasks. She has made significant contributions to agents in uncertain and dynamic environments, including distributed robot localization and world modeling, strategy selection in multiagent systems in the presence of adversaries, planning by analogical reuse, and more recently, robot learning from demonstration. Her research contributions have also been realized concretely in the form of teams of robot soccer playing agents that have won several international championships at the annual RoboCup robot soccer competitions. Her impact and visibility has been consistently high over the past two decades for her technical contributions, for her impressive robot teams, and for her leadership within the research community.”*
- **AAAI Fellow**, the Association for the Advancement of Artificial Intelligence, elected May 2003.
- **Allen Newell Excellence in Research Award**, 1997.
- **National Science Foundation Career Award**, 1995.
- **AT&T Information Systems Award for Outstanding Academic Achievement**, 1986.
- Fellowship from the National Institute for Scientific Research, Portugal, 1984-1987.

Best Paper Awards and Competitions

- Outstanding Paper Award, Twenty-Second on Artificial Intelligence (AAAI), “Thresholded Rewards: Acting Optimally in Timed Zero-Sum Games,” C. McMillen and M. Veloso, 2007.
- The 2005 Professional Engineering (PE) Publishing Award, Journal of Systems and Control Engineering, “STP: Skills, Tactics and Plays for Multi-Robot Control in Adversarial Environments,” B. Browning, J. Bruce, M. Bowling, and M. Veloso, 2007.
- Best Paper Award, European Conference on Case-Based Reasoning, “Retrieving and reusing game plays for robot soccer,” R. Ros, M. Veloso, R. L. Mantaras, C. Sierra, and J. L. Arcos, 2006.
- Best Paper Award, International Conference on AI Planning Systems “Planning for distributed execution through use of probabilistic opponent models,” P. Riley and M. Veloso, 2002.
- RoboCup Simulation League Placings: 1st (1998, 1999), 3rd (1997, 2000).
- RoboCup Small Robot League Placings: 1st (1997, 1998, 2006, 2007), 2nd (2008, 2010), QF (2009).
- RoboCup Sony AIBO Robot League Placings: 1st (1998, 2002), 2nd (2001), 3rd (1999, 2000, 2007).
- RoboCup Standard Platform League, NAO Humanoids, Placing: 2nd (2008), QF (2009), SF (2010).

Peer Community Service Honors

- **AAAI President** (2010–2015), Elect (2010–2011), Past (2014–2015)
- **President**, The RoboCup Federation, (2008–2011).
- **Vice-President**, The RoboCup Federation, (2000–2008).
- **Trustee**, The RoboCup Federation, 1997 – present.
- Member of the CRA-W Board, since 2009.
- **Trustee** of IJCAI, 2005–2009.
- Member of the Robot Hall of Fame Jury, since 2005.
- **IJCAI’07 Program Chair**, the Twentieth International Joint Conference on Artificial Intelligence, Hyderabad, India, 2007.
- **AAAI’05 Program Co-Chair**, the Twentieth National Conference on Artificial Intelligence, 2005.

Teaching

- Founder and co-Director of the “V-Unit”, a project-based course for graduate students to have an opportunity “to grow a Vision” on how technology can address and impact societal problems (www.cs.cmu.edu/~vunit/), since 2004.
- AI for Sustainability and Health Care – Spring’12
- CMRoboBits: Creating Complete Intelligent Robots – Fall’11, ’10, ’09, ’08, ’07, ’05, ’04, ’03
- Planning, Execution, and Learning (graduate) – Fall/Spring ’10, ’08, ’05, ’04, ’02, ’01, ’99, ’97.
- Introduction to Artificial Intelligence – Fall/Spring ’11, ’09, ’08, ’05, ’01, ’00, ’98, ’97, ’96, ’95.
- Artificial Intelligence (graduate) – Spring’10, ’05, ’03, ’98, ’95, ’94, ’93.
- Multiagent Systems: Theory and Hands-On Experience (graduate) – Spring’01.
- Embodied Intelligence (graduate) - MIT 6.836, Spring’00.
- Artificial Intelligence - MIT 6.034, Fall’99.
- Fundamentals of Computer Science – Fall’93.
- Several conference tutorials and short courses on *Robotic Soccer* (Agents-99, AAAI-99, IJCAI-99) and on *Planning and Learning* (ICAPS-04, ICML-95, IJCAI-95, FirstUSA, CMU Summer courses).

Brief Research Highlights (*see www.cs.cmu.edu/~mmv/ for updated publications and details*)

- I founded and direct the CORAL research group for the study of agents, robots, that Collaborate, Observe, Reason, Act and Learn. Since 1992. (www.cs.cmu.edu/~coral/).
- As of July 2011, I have graduated twenty three Ph.D. students, and currently advise twelve Ph.D. students. I have advised more than thirty undergraduate students, including eight senior theses.
- I have worked with fifteen PostDoctoral Fellows.
- Patent: Method of Autonomous Machine Learning, Astro Teller and Manuela Veloso, Patent Number 5,781,698, July 14, 1998.

I research in artificial intelligence and robotics. My long-term research goal is the effective construction of autonomous agents where cognition, perception, and action are combined to address planning, execution, and learning tasks. My vision is that multiple intelligent robots with different sets of complementary capabilities will provide a seamless synergy of intelligence. With my students, I investigate effective planning, execution, and learning algorithms for autonomous robots and agents within my CORAL laboratory.

One of my main research projects, as of 2012, includes the introduction of **Symbiotic Autonomy** for intelligent robots, in which robots are aware of their perceptual, cognitive, and actuation limitations, and know how to address such limitations: they rely on asking for help from humans in the environments for what they are not able to perform, or accessing the web for what they miss to know. Our mobile collaborative robots, CoBots, have been running in our multi-floor buildings under this new symbiotic autonomy, completely unsupervised performing tasks for users. For the last few months, they have already navigated for more than 150km. With this novel symbiotic autonomy approach, robots have a potential to be effectively viable in many applications, ranging from providing intelligent telepresence, and assisting and helping disabled people, elderly, and humans in general. (www.cs.cmu.edu/~coral/cobot/).

Following up on our extensive research in distributed agents in complex environments, we recently focused on researching on modeling the **Smart Grid** as a distributed multiagent system with broker, customer, and producer agents.