Brian C. Williams

Professor of Aeronautics and Astronautics
Undergraduate Officer

Contact

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Professor Williams received his S.B., S.M and Ph.D. in Computer Science and Electrical Engineering at MIT, and worked at the Xerox Palo Alto Research Center and NASA Ames Research Center, prior to joining the faculty at MIT. He is a pioneer in the fields of qualitative reasoning, model-based diagnosis and autonomous systems. He received a NASA Space Act Award for Remote Agent, the first fully autonomous, self-repairing space explorer, demonstrated onboard the NASA Deep Space One probe in May, 1999. He was a member of the Tom Young Blue Ribbon Team in 2000, assessing future Mars missions in light of the Mars Climate Orbiter and Polar Lander incidents, and is currently a member of the Advisory Council of the NASA Jet Propulsion Laboratory at Caltech. He has won four best paper prizes for his research in diagnosis, qualitative algebras, propositional inference and soft constraints. He is a fellow of AAAI, has served as guest editor of the Artificial Intelligence Journal and has been on the editorial boards of the Journal of Artificial Intelligence Research, and MIT Press.

Honors and Awards

MIT AI Lab Merit Award for Basic Research in Artificial Intelligence, 1987; Best Paper Award, National Conference on Artificial Intelligence, 1988; NASA Ames Team Excellence Award – New Millennium Advanced Autonomy Prototype Demonstration, 1995; Best Paper Award, National Conference on Artificial Intelligence, 1997; NASA Group Achievement Award, The Deep Space One Project Flight Software Team, 1999; NASA Space Act Award & Software of the Year — Remote Agent: Autonomous Reasoning and Control for Spacecraft and Other Complex Systems, 1999; NASA Group Achievement Award for the Independent Assessment of the Mars Climate Orbiter and Mars Polar Lander Failures, 2000; Distinguished Paper Award, International Joint Conference on Artificial Intelligence, 2001; Finalist, World Technology Award for Space, 2003; Best Paper Award, European Conference on Artificial Intelligence, 2004; NASA Group Achievement Award, Portable Satellite Assistant First GenerationTeam, 2004

Society Memberships

American Association of Artificial Intelligence, American Institute of Aeronautics and Astronautics, Association for Computational Machinery, Institute of Electrical and Electronics Engineers

Positions Held at MIT

Professor of Aeronautics and Astronautics, 2007-Present Associate Professor of Aeronautics and Astronautics, 2002-2007 Finmeccanica Professor of Aeronautics and Astronautics, 2001-2002 Boeing Associate Professor of Aeronautics and Astronautics, 1999-2001

Specialization and Research Interests

Professor Williams leads the Model-based Embedded and Robotic Systems group, within the Computer Science and Artificial Intelligence Laboratory (CSAIL) at the Massachusetts Institute of Technology. His research concentrates on model-based autonomy -- the creation of long-lived systems that explore autonomously, while commanding, diagnosing and repairing themselves using fast, commonsense reasoning. Current research focuses on model-based programming and cooperative robotics: Model-based programming supports goal-directed programming of robust explorers and everyday devices, by incorporating model-based deductive capabilities within traditional embedded programming languages. Cooperative robotics extends model-based autonomy to robotic networks of cooperating space, air, land and undersea vehicles, on Earth and on other planets.

Teaching Interests

Principles of autonomy and decision making, cognitive robotics, artificial intelligence, operations research, robot coordination, energy management

Lab/Research Group Affiliation:

Space Systems Laboratory

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