Manfred Huber

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Research Interests:

Autonomous Robot Systems, Hierarchical Reinforcement Learning, Sensor-driven Robotics, Machine Learning, Artificial Intelligence, Development of Intelligent Behavior, Cognitive Architectures, Human/Robot Interaction.

Education:

1993-2000	University of Massachusetts at Amherst, Ph.D., Computer Science. Dissertation Title: A Hybrid Architecture for Adaptive Robot Control. Ph.D. Committee: Roderic A. Grupen, Andrew G. Barto, Richard S. Sutton (Computer Science), John W. Donahoe (Psychology)	Amherst, MA
1991-1993	University of Massachusetts at Amherst, M.S., Computer Science. Masters Project: 2-D Contact Detection and Localization using Proprioceptive Information.	Amherst, MA
1990-1991	University of Karlsruhe, Graduate studies in Computer Science.	Karlsruhe, Germany
1988-1990	University of Karlsruhe, 'Vordiplom' in Computer Science.	Karlsruhe, Germany

Research Experience:

2006-present	University of Texas at Arlington, Associate Professor. Department of Computer Science and Engineering.	Arlington, TX
2000-2006	University of Texas at Arlington, Assistant Professor. Department of Computer Science and Engineering.	Arlington, TX
1999-2000	University of Texas at Arlington, Visiting Assistant Professor. Department of Computer Science and Engineering.	Arlington, TX
1998-1999	University of Massachusetts at Amherst, Project Assistant. Laboratory for Perceptual Robotics, Department of Computer Science.	Amherst, MA
1996-1999	University of Massachusetts at Amherst, Research Assistant. Laboratory for Perceptual Robotics, Department of Computer Science.	Amherst, MA
1992-1995	University of Massachusetts at Amherst, Research Assistant. Laboratory for Perceptual Robotics, Department of Computer Science.	Amherst, MA

Teaching Experience:

2006-present	University of Texas at Arlington, Associate Professor. CSE 4308 / CSE 5361 - Artificial Intelligence I. CSE 4360 / CSE 5364 - Robotics. CSE 5364 - Artificial Intelligence II. CSE 6392 - Reasoning with Uncertainty for Data Interpretation, Modeling, and Robotics.	Arlington, TX

2000-2006	University of Texas at Arlington, Assistant Professor. CSE 2315 - Discrete Structures. CSE 3315 - Theoretical Concepts. CSE 4308 / CSE 5361 - Artificial Intelligence I. CSE 4392 - Distributed Rational Agents. CSE 4392 / CSE 5392 - Smart Home Technologies. CSE 5364 - Artificial Intelligence II. CSE 4360 / CSE 5364 - Robotics. CSE 6392 - Reasoning with Uncertainty for Data Interpretation, Mod eling, and Robotics.	Arlington, TX
1999-2000	University of Texas at Arlington, Visiting Assistant Professor. CSE 2315 - Discrete Structures. CSE 4360 / CSE 5364 - Robotics.	Arlington, TX
1996	University of Massachusetts at Amherst, Teaching Assistant. CMPSCI 121 - Introduction to Problem Solving using Computers, Department of Computer Science. Responsibilities: Giving Discussion Sections, Administering Exams, Grading Homeworks and Exams. Professors in Charge: Robert N. Moll, Allen R. Hanson	Amherst, MA

Publications:

a) Journal and Magazine Articles:

- G. Zaruba, M. Huber, F. Kamangar, and I. Chlamtac. Indoor Location Tracking Using RSSI Reading from a Single Access Point. *ACM/Kluwer Journal of Wireless Networks*, Vol. 14, No. 2, pp. 221-235, 2006.
- G. Zaruba, F. Kamangar, M. Huber, and D. Levine. Connect - A Personal Remote Messaging and Monitoring System to Aid People with Disabilities. In *IEEE Communications*, Vol. 43, No. 9, pp. 101-109, September 2005.
- S. Rajendran and M. Huber. Learning Task-Specific Sensing, Control and Memory Policies. *International Journal on Artificial Intelligence Tools*, Vol. 14, No. 1-2, pp. 303-328, 2005.
- D.J. Cook, M. Huber, R. Yerraballi, and L.B. Holder. Enhancing Computer Science Education with a Wireless Intelligent Simulation Environment. *Journal of Computing in Higher Education*, Vol. 16, No. 1, pp. 106-127, 2004.
- F. Torres-Verdin and M. Huber. Learning a Causal Model from Household Survey Data Using a Bayesian Belief Network. *Transportation Research Record*, No. 1836, pp. 29 - 36, 2003.
- M. Huber and R.A. Grupen. A Hybrid Architecture for Learning Robot Control Tasks. *Robotics Today*, Vol. 13, No. 4, Fall 2000, RI/SME.
- M. Huber and R.A. Grupen A Feedback Control Structure for On-line Learning Tasks. *Robotics and Autonomous Systems*, Vol. 22, No. 3-4, pp. 303-315, December 1997.
- E.G. Araujo, G.A. Dakin, M. Huber and R.A. Grupen. Hierarchical Scheduling of Robotic Assembly Operations in a Flexible Manufacturing System. *International Journal of Flexible Automation and Integrated Manufacturing*, Vol. 3, No. 3&4, pp. 301-316, 1995. Begell House.
- R.A. Grupen, M. Huber, J.A. Coelho Jr. and K. Souccar. A Basis for Distributed Control of Manipulation Tasks. *IEEE Expert, Special Track on Robotics*, Vol. 10, No. 2, pp. 9-14, April 1995.
- M. Huber and R.A. Grupen. 2-d Contact Detection and Localization using Proprioceptive Information. *IEEE Transactions on Robotics and Automation*, Vol. 10, No. 1, pp. 23-33, February 1994.

b) Book Chapters:

- M. Huber. Automated Decision Making. In D. J. Cook and S. Das, Editors, *Smart Environments: Technologies, Protocols and Applications*, Wiley, 2004.

c) Conference and Symposium Proceedings:

- H. Ryu and M. Huber. A Particle Filter Approach for Multi-Target Tracking, In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems (IROS'07)*, San Diego, CA, 2007.
- R. Huang, G.V. Zaruba and M. Huber. Complexity and Error Propagation of Localization Using Interferometric Ranging, In *IEEE International Conference on Communications (ICC'07)*, Glasgow, Scotland, 2007.
- M. Asadi and M. Huber. Effective Control Knowledge Transfer Through Learning Skill and Representation Hierarchies, In *International Joint Conference on Artificial Intelligence*, pp. 2054-2059, Hyderabad, India, 2007.
- V.N. Papudesi and M. Huber. Learning Behaviorally Grounded State Representations for Reinforcement Learning Agents, In *Prodeedings of the Sixth International Conference on Epigenetic Robotics*, Paris, France, 2006.
- A. Sabbi and M. Huber. Particle Filter Based Object Tracking in a Stereo Vision System, In *Prodeedings of the IEEE International Conference on Robotics and Automation*, Orlando, FL, 2006.
- E. Torres-Verdin and M. Huber. Learning Personalized Query Modifications, In *Prodeedings of the 19th International FLAIRS Conference*, Melbourne Beach, FL, 2006.
- M. Asadi and M. Huber. Hierarchical State Abstraction with Subgoal Discovery Using Learned Policies, In *Prodeedings of the International Conference on Machine Learning; Models, Technologies and Applications*, Las Vegas, NV, 2005.
- F. Elliott and M. Huber. Learning Macros with an Enhanced LZ78 Algorithm, In *Prodeedings of the 18th International FLAIRS Conference*, Clearwater Beach, FL, 2005.
- R.A. Grupen and M. Huber. A Framework for the Development of Robot Behavior, *AAAI Spring Symposium on Developmental Robotics*, Stanford, CA, 2005.
- V. Seshadri, G.V. Zaruba, and M. Huber. A Bayesian Sampling Approach to In-door Localization of Wireless Devices Using Received Signal Strength Indication, In *Prodeedings of the 3rd IEEE International Conference on Pervasive Computing and Communications*, Kauai, HI, 2005.
- C.J. Hannon, L.J. Burnell, and M. Huber. Research to Classroom: Experiences from a Multi-Institutional Course in Smart Home Technologies, In *SIGCSE Technical Symposium on Computer Science Education*, St. Louis, MI, 2005.
- M. Asadi and M. Huber. Action Dependent State Space Abstraction for Hierarchical Learning Systems, In *Prodeedings of the IASTED International Conference on Artificial Intelligence and Applications*, Insbruck, Austria, 2005.
- G.V. Zaruba, M. Huber, F.A. Kamangar, and A. Chlamtac. Monte Carlo Sampling Based In-Home Location Tracking With Minimal RF Infrastructure Requirements, In *Prodeedings of the 47th GlobeCom Conference*, Dallas, TX, 2004.
- V.N. Papudesi and M. Huber. Interactive Refinement of Control Policies for Autonomous Robots, In *Prodeedings of the 10th IASTED International Conference on Robotics and Applications*, Honolulu, HI, 2004.
- S. Rajendran and M. Huber. Learning Task-Specific Memory Policies, In *Prodeedings of the 6th IASTED International Conference on Intelligent Systems and Control*, Honolulu, HI, 2004.
- S. Gudla and M. Huber. Learning Imitation Strategies Using Cost-Based Policy Mapping and Task Rewards, In *Prodeedings of the 6th IASTED International Conference on Intelligent Systems and Control*, Honolulu, HI, 2004.
- M. Asadi and M. Huber. State Space Reduction For Hierarchical Reinforcement Learning, In *Proceedings of the 17^{th} International FLAIRS Conference*, Miami Beach, FL, 2004.
- S. Rajendran and M. Huber. Developing Task Specific Sensing Strategies Using Reinforcement Learning, In *Proceedings of the 17^{th} International FLAIRS Conference*, Miami Beach, FL, 2004.
- Y. Wang, M. Huber, V.N. Papudesi, and D.J. Cook. User-Guided Reinforcement Learning of Robot Assistive Tasks for an Intelligent Environment. In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems*, Las Vegas, NV, 2003.

- R. Platt, O. Brock, A. H. Fagg, D. Karupiah, M. Rosenstein, J. Coelho Jr., M. Huber, J. Piater, D. Wheeler, and R. A. Grupen. Framework For Humanoid Control and Intelligence. In *Proceedings of the 2003 IEEE International Conference on Humanoid Robots*, Karlsruhe & Munich, Germany, 2003.
- R. Huang, G.V. Zaruba, and M. Huber. Link Longevity Kalman-Estimator for Ad Hoc Networks. In *Proceedings of the 54th IEEE Vehicular Technology Conference*, 2003.
- F. Khawaja, D. Gjoni, M. Huber, D. Cook, and M. Youngblood. Achieving Faster Convergence to the Optimal Policy by Using Knowledge of the Unimodal Reward Structure. In *Proceedings of the IASTED International Conference on AI and Applications*, Spain, 2003.
- V.N. Papudesi and M. Huber. Learning from Reinforcement and Advice Using Composite Reward Functions. In *Proceedings of the 16^{th} International FLAIRS Conference*, pp. 361–365, St. Augustine, FL, 2003.
- S. Goel and M. Huber. Subgoal Discovery for Hierarchical Reinforcement Learning Using Learned Policies. In *Proceedings of the 16^{th} International FLAIRS Conference*, pp. 346–350, St. Augustine, FL, 2003.
- S. Gudla and M. Huber. Cost-Based Policy Mapping for Imitation. In *Proceedings of the 16^{th} International FLAIRS Conference*, pp. 17–21, St. Augustine, FL, 2003.
- V.N. Papudesi, Y. Wang, M. Huber, and D.J. Cook. Integrating User Commands and Autonomous Task Performance in a Reinforcement Learning Framework. *AAAI Spring Symposium on Human Interaction with Autonomous Systems in Complex Environments*, Stanford University, 2003.
- F. Torres-Verdin and M. Huber. Learning a Causal Model from Household Survey Data Using a Bayesian Belief Network. In *Proceedings of the 82nd Meeting of the Transportation Research Board*, Washington, D.C., 2003.
- M. Huber and R.A. Grupen. Robust Finger Gaits from Closed-Loop Controllers. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 1578-1584, Lausanne, Switzerland, 2002.
- M. Huber. Learning Hierarchical Control Policies Using Closed-Loop Actions. *Proceedings of the 6th IASTED International Conference on Artificial Intelligence & Soft Computing*, pp. 356–361, Banff, Canada, 2002.
- M. Huber. A Hybrid Architecture for Hierarchical Reinforcement Learning. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Vol. 4, pp. 3290–3295, San Francisco, CA, April 2000.
- M. Huber and R.A. Grupen. A Hybrid Architecture for Learning Robot Control Tasks. *AAAI 1999 Spring Symposium : Hybrid Systems and AI - Modeling, Analysis and Control of Discrete + Continuous Systems*, Stanford University, CA.
- J.A. Coelho Jr., E.G. Araujo, M. Huber, and R.A. Grupen. Dynamical Categories and Control Policy Selection. *Proceedings of the 1998 IEEE ISIC/CIRA/ISAS Joint Conference*, pp. 459–464, Gaithersburg, MD, September 1998.
- M. Huber and R. A. Grupen. A Control Structure for Learning Locomotion Gaits. *Seventh International Symposium on Robotics with Applications (ISORA'98)*, Anchorage, AK, May 1998.
- M. Huber and R. A. Grupen. Learning to Coordinate Controllers - Reinforcement Learning on a Control Basis. *Fifteenth International Joint Conference on Artificial Intelligence*, pp. 1366–1371, Nagoya, Japan, IJCAII, August 1997.
- M. Huber and R. A. Grupen. Prior Structure for On-line Learning. *1997 IEEE International Symposium on Computational Intelligence in Robotics and Automation (CIRA'97)*, pp. 124–129, Monterey, CA, IEEE, July 1997.
- M. Huber, W.S. MacDonald and R. Grupen. A Control Basis for Multilegged Walking. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Vol. 4, pp. 2988–2993, Minneapolis, MN, April 1996.
- E. Araujo, G. Dakin, M. Huber and R. Grupen. Hierarchical Scheduling of Robotic Assembly Operations in a Flexible Manufacturing System. In *Proceedings of the 5^{th} International Conference on Flexible Automation and Intelligent Manufacturing (FAIM '95)*, pp. 778–789, Stuttgart, Germany, June 1995.

- R. Grupen, J. Coelho Jr., C. Connolly, V. Gullapalli, M. Huber, and K. Souccar. Toward Physical Interaction and Manipulation: Screwing in a Light Bulb. *1994 AAAI Spring Symposium on Physical Interaction and Manipulation*, pp. 103-108, Stanford University, March 1994.
- R.A. Grupen and M. Huber. 2-D Contact Detection and Localization using Proprioceptive Information. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Vol. 2, pp. 130–135, Atlanta, GA, May 1993.
- M. Huber and R.A. Grupen. Contact Information from Proprioception. *Intelligent Autonomous Systems IAS-3*, pp. 643–652, Pittsburgh, PA, February 1993.

d) Workshops:

- E. Torres-Verdin and M. Huber. Learning Query Reformulations for Personalized Web Search Using a Probabilistic Inference Network, In *AAAI 2007 Workshop on Intelligent Techniques for Web Personalization*, Vancouver, BC, Canada, 2007.
- M. Asadi, V.N. Papudesi, and M. Huber. Learning Skill and Representation Hierarchies for Effective Control Knowledge Transfer, In *ICML 2005 Workshop on Structural Knowledge Transfer for Machine Learning*, Pittsburgh, PA, 2006.
- M. Asadi and M. Huber. Accelerating Action Dependent Hierarchical Reinforcement Learning Through Autonomous Subgoal Discovery, In *ICML 2005 Workshop on Rich Representations for Reinforcement Learning*, Bonn, Germany, 2005.
- M. Huber and R.A. Grupen. Learning Robot Control - Using Control Policies as Abstract Actions. In *NIPS'98 Workshop : Abstraction and Hierarchy in Reinforcement Learning*, Breckenridge, CO, December 1998.
- J. A. Coelho Jr., E. G. Araujo, M. Huber and R. A. Grupen. Contextual Control Policy Selection. *Workshop on Robot Exploration and Learning, Conald'98*, Pittsburgh, PA, June 1998.
- M. Huber and R. A. Grupen. Adaptive Walking Gaits from Closed-Loop Control Primitives. In *New approaches on dynamic walking and climbing machines, Workshop II, 8^{th} International Conference on Advanced Robotics (ICAR 97)*, Monterey, CA, July 1997.

e) Technical Reports:

- M. Asadi and M. Huber. Learning State and Action Hierarchies for Reinforcement Learning Using Autonomous Subgoal Discovery and Action-Dependent State Space Partitioning. *CSE@UTA Technical Report* CSE-2005-12, 2005.
- G. V. Zaruba, M. Huber, and F. A. Kamangar. Monte Carlo Sampling Based In-Home Location Tracking With Minimal RF Infrastructure Requirements. Technical Report CSE-2002-6, Department of Computer Science and Engineering, University of Texas at Arlington, 2002.
- M. Huber and R. A. Grupen. A hybrid discrete event dynamic systems approach to robot control. Technical Report 96-43, Department of Computer Science, University of Massachusetts at Amherst, October 1996.
- M. Huber and R.A. Grupen. 2-D Contact Detection and Localization using Proprioceptive Information. Technical Report 92-59, Department of Computer Science, University of Massachusetts at Amherst, August 1992.

f) Refereed Video Proceedings:

- J. Coelho Jr., R.A. Grupen, M. Huber, W. MacDonald and K. Souccar. Robust Control Basis for Coordinating Multiple Manipulators. In *Video proceedings of the 1995 IEEE International Conference on Robotics and Automation*, Nagoya, Japan.
- J. Coelho Jr., C. Connolly, R. Grupen, M. Huber and K. Souccar. Experiments in Autonomous Reaching and Grasping. In *Video proceedings of the 1994 IEEE International Conference on Robotics and Automation*, San Diego, CA.

g) Other Publications:

- M. Huber. A Hybrid Architecture for Adaptive Robot Control. *PhD dissertation, University of Massachusetts at Amherst*, 2000.

Funding History:

2007-2008	PLR: Mesh Networked, Two-way Personnel Locator Radios and Relays. *NIJ*, PIs: G.V. Zaruba, M. Huber, F.A. Kamangar, D. Levine, $265,000
2007-2008	UTA/TPD Proposal for Research and Development in a Software Security Environment. *TheftProof Data, Inc.*, PIs: F.A. Kamangar, G.V. Zaruba, M. Huber, D. Levine, G.V. Zaruba, M.Huber, M. Wright, $105,528
2007-2010	Teleherence: Monitoring/Increasing Adherence via Web Telecommunications. *NIH-NLM*, PIs: G.V. Zaruba, D. Schoech, F.A. Kamangar, M. Huber, D. Levine, $404,870
2007	SMT (Surface Mount Technology) Prototyping Workstation. *UTA CoE-REF*, PIs: G.V. Zaruba, M.Huber, F. Kamangar, Roger Walker, J.C. Chiao, Daniel Engels, $25,733
2006-2009	REU Site: Research Experiences for Undergraduates in Information Processing and Decision Making for Intelligent and Secure Environments. *NSF-REU*, PIs: M. Huber, I. Ahmad, G.V. Zaruba, J.C. Tiernan, $281,614
2006-2007	Remote Monitoring and Control of Sensor/Actuator Nodes in Cellular Networks. *Sensor Logic, Inc.*, PIs: F.A. Kamangar, G.V. Zaruba, M. Huber, D. Levine, $85,122
2005-2006	Transfer Learning in Integrated Cognitive Systems. *DARPA Transfer Learning*, PI: P. Langley; UTA Personnel: L. Holder, D. Cook, M. Huber, M. Youngblood, UTA Budget: $641,000
2005-2008	Expansion of CSE@UTA Robot Programming Contest to Increase Computer Science and Engineering Recruitment. *Texas Technology Workforce Development*, PIs: C. Tiernan, M. Huber. $ 161,415
2003-2005	Connect - A Personal Remote Messaging and Monitoring Infrastructure for Persons with Disabilities. *Texas Health and Human Services Commission*, PIs: F. Kamangar, D. Cook, S. Das, M. Huber, M. Kumar, D. Levine, D. Schoech, B. Shirazi, G. Zaruba. $ 2,112,000
2002-2006	CRCD: An Active Collaborative Learning Program in Smart Home Technologies. *NSF CR-CD*, PIs: M. Huber, D. Cook, J. Priest, L. Burnell, C. Hannon, and W. Williamson. $ 323,854
2002-2006	REU Site: Research Experiences for Undergraduates in Distributed Rational Agents. *NSF REU*, PIs: B.Shirazi and M. Huber. $ 185,111
2001-2005	MavHome: Development of an Intelligent Home Environment. *NSF ITR*, PIs: D. Cook, S. Chakravarthy, S. Das, P. Gmytrasiewicz, L. Holder, M. Huber, F. Kamangar, and R. Yeraballi. $ 1,159,959
2001-2004	Instrumentation for Intelligent Agent and Wireless Computing Research. *NSF MRI*, PIs: D. Cook, S. Das, L. Holder, M. Huber, R. Yeraballi. $ 426,284
2001-2002	Learning Focus of Attention for Active Perception. *UTA REP*, PIs: M. Huber. $ 10,000

Professional Activities:

a) Associate Editor:

- IEEE Transactions on Systems, Man, and Cybernetics - Part B

b) Program Committee Member:

- FLAIRS Conference
- IEEE International Conference on Robotics and Automation
- IROS Conference
- ICML Workshop on Machine Learning Techniques for Autonomous Space Application
- National Conference on Artificial Intelligence
- Genetic and Evolutionary Computation Conference

c) Technical Committee Member:

- RAS Technical Committee on Human/Robot Interaction
- RAS Technical Committee on Service Robots

d) Proposal Reviewing:

- NSF Information and Intelligent Systems Division
- NSF Computer and Network Systems Division
- Air Force Office for Scientific Research

e) Journal Reviewing:

- IEEE Transactions on Vehicular Technology
- European Journal of Operational Research
- International Journal of Pattern Recognition and Artificial Intelligence
- International Journal on Artificial Intelligence Tools
- Journal on Decision Support Systems
- IEEE Transactions on Robotics and Automation
- IEEE Transactions on System, Man, and Cybernetics
- Autonomous Robots
- Robotics and Autonomous Systems

f) Conference Reviewing:

- International FLAIRS Conference
- IEEE International Conference on Robotics and Automation
- IEEE International Conference on Intelligent Robots and Systems
- Neural Information Processing Systems (NIPS)
- IEEE International Symposium on Computational Intelligence in Robotics and Automation
- International Conference on Autonomous Agents
- National Conference on Artificial Intelligence
- International Conference on Machine Learning

Fellowships and Awards:

2006	Lockheed Martin Excellence in Engineering Teaching Award
2004	UTA College of Engineering Outstanding Young Faculty Award
2003	CSE Department Keeper of the Vision Award
1997	International Joint Conference on Artificial Intelligence (IJCAI) Travel Grant
1996-1997	University of Massachusetts Amherst Graduate School Fellowship
1991-1992	Baden-Württemberg Exchange Program Scholarship

UTA Recognitions:

2007	Research Excellence Award, College of Engineering, UTA
2006	Research Excellence Award, College of Engineering, UTA
2005	Research Excellence Award, College of Engineering, UTA

Professional Affiliations:

2005-present	ASEE Member
2002-present	ACM Member
2002-present	IASTED Member
1999-present	AAAI Member
1993-present	IEEE Member