
FREDERICK L. CRABBE IV

U.S. Naval Academy
Computer Science Department
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EDUCATION

- University of California, Los Angeles, CA.** 7/96-6/00
Ph.D. Dissertation: "DiscoTech: Construction and Learning Among Neurally Controlled Animats."
Advisor: Michael G. Dyer.
- University of California, Los Angeles, CA.** 9/92-6/96
M.S. Major in Artificial Intelligence, minors in Linguistics and Databases.
- Dartmouth College, Hanover, NH.** 9/88-6/92
A.B. Major: Computer Science modified with Philosophy. Senior Project:
DoubleSpeak- A Macintosh chat client and server using the Unix talk protocol.

RESEARCH EXPERIENCE

- Carnegie Mellon University, Pittsburgh, PA.** 6/07-7/08
Visiting Professor. Participating in research projects on human robot collaboration and communication.
- U.S. Naval Academy, Annapolis, MD.** 8/05-Present
Associate Professor. Developing a research program of machine learning and biological modeling in robotics.
- U.S. Naval Academy, Annapolis, MD.** 8/00-8/05
Assistant Professor. Developed a research program of Machine Learning in Robotics.
- University of California, Los Angeles, CA.** 9/97-7/00
Research Assistant. Researched and wrote dissertation on neural-net controlled agents that learn and survive in a construction environment.
- Sun Microsystems Laboratories, Chelmsford, MA.** 6/97-9/97
Research Intern. Develop a speech enhanced GUI e-mail reader. Designed the dialog model and the grammars for the language parser.
- Sun Microsystems Laboratories, Chelmsford, MA.** 6/96-9/96
Research Intern. Designed and implemented a language and interpreter for describing a discourse model in an interactive spoken language dialog system.
- Sun Microsystems Laboratories, Chelmsford, MA.** 6/95-9/95
Research Intern. Introduced a semantically based discourse context component to an existing interactive spoken language dialog system. Unknown references were resolved by matching semantic constraints with contents of a context stack.
- Air Force Research Laboratories-Rome Labs, Rome, NY** 6/94-9/94
Research Intern. Used word co-occurrences to cluster words in high dimensional space, resulting in pseudo-semantic clusters of word vectors.
- Los Alamos National Laboratory, Los Alamos, NM** 6/93-9/93
Research Intern. Trained self-organizing Kohonen Feature Maps to analyze trouble spots in acoustic data to identify the shape of a speaker's vocal-tract.

HONORS

Fred Skove Research Award , US Naval Academy	2006
USNA Apgar Award Nomination , US Naval Academy	2004
Frank Chi Teaching Award , US Naval Academy	2003
Frank Chi Teaching Award , US Naval Academy	2002
Outstanding Paper , Sun Microsystems Laboratories, The First Ten Years	2001
Honorary Inductee , Golden Key International Honour Society.	2001
Best Paper of Session Award , International Joint Conference on Neural Networks	1999
Student Travel Scholarship , International Joint Conference on Neural Networks	1999
John G. Kemeny Computing Prize , Dartmouth College	1992
Class of 1884 Scholarship , Dartmouth College	1990

TEACHING EXPERIENCE

U.S. Naval Academy.	8/00-8/06
<i>Associate Professor.</i> Taught:	
SI420 Artificial Intelligence.	
SI475 Intelligent Robotics.	
SI481L MatLab for Economics Majors.	
IT486B Natural Language Processing.	
SI321 Advanced Data Structures	
<i>Assistant Professor.</i> Taught:	
SI204 Introduction to Computer Science.	
SI221 Data Structures.	
SI262 Discrete Mathematics.	
SI321 Advanced Data Structures	
SI420 Artificial Intelligence.	
SI475 Introduction to Robotics and Machine Vision.	
UCLA Marina Aquatic Center , Sailing program.	
<i>Certified Instructor.</i> Taught all levels of small boat sailing to adults, including 1-2 hours per week of lecture and 3-4 hours per week on-the-water training.	6/99-8/00
<i>Teaching Assistant.</i> Provided one-on-one sailing instruction at all levels of small boat sailing.	9/97-6/99
UCLA Computer Science Department.	1/93-6/96
<i>Teaching Assistant.</i> Lectured 2-4 hours per week, held office hours 2 hours per week, designed and graded assignments and final projects for:	
Computer Science 163, Introduction to Natural Language Processing,	
Computer Science 161, Fundamentals of Artificial Intelligence,	
Computer Science 111, Operating Systems Principles,	
Computer Science 32, Introduction to Computer Science 2.	

JOURNAL ARTICLES

- Crabbe, F.L. *Compromise Strategies for Action Selection* to appear in The Philosophical Transactions of the Royal Society, Part B, vol 362, September 2007.
- McMath, S., Crabbe F., Joyner D. *Continued fractions and Parallel SQUFOF*. International Journal of Pure and Applied Mathematics 34(1), 2007, pp. 19-38.
- Crabbe, F., *Unifying Undergraduate Artificial Intelligence Robotics: Layers Of Abstraction Over Two Channels* AI Magazine, 27(1), 2006, pp 23-37.
- Bishop, B., Crabbe, F. and Hudock, B., *Design of a Low-Cost, Highly Mobile Urban Search and Rescue Robot*. Advanced Robotics. 19(8) 2005, pp. 797-928.
- Crabbe, F., Dyer, M., *Goal Directed Adaptive Behavior in Second-Order Neural Networks: The MAXSON family of architectures*. Adaptive Behavior, 8(2), 2001. pp. 149-171.
- Martin, P., Crabbe, F., Adams, S., Baatz, E., Yankelovich, N., *SpeechActs: A Spoken Language Framework*. IEEE Computer, 29(7), 1996. pp. 33-40.

BOOK CHAPTERS

- Martin, P., Crabbe, F., Adams, S., Baatz, E., Yankelovich, N., *SpeechActs: A Spoken Language Framework*. in Sun Microsystems Laboratories: The First Ten Years 1991-2001, Treichel and Holzer, eds. Sun Labs, 2001, pp. 10.1-10.10. (This is a reprint of the IEEE Computer paper above).
- Crabbe, F., Dyer M., *Goal Directed Adaptive Behavior in Second-Order Neural Networks: Learning and Evolving in the MAXSON architecture*. in "Advances in the Evolutionary Synthesis of Intelligent Agents," Honavar and Patel eds. MIT Press, 2001

CONFERENCE PAPERS

- Crabbe, F.L., *On Compromise Strategies for Action Selection with Proscriptive goals*. In the proceedings of Modeling Natural Action Selection, 2005, p. 24-31.
- Crabbe, F.L., *Optimal and Non-Optimal Compromise Strategies in Action Selection*. In the proceedings of the Eighth International Conference on Simulation of Adaptive Behavior (SAB), 2004. pp. 233-242.
- Hudock, B.M., Bishop, B.E. and Crabbe, F.L., *On the Development of a Novel Urban Search and Rescue Robot*, in Proceedings of the Thirty-Sixth Southeastern Symposium on System Theory, 2004, pp. 451-455.
- Fong, E., Adams, W., Crabbe, F.L., Schultz, A. C., *Representing a 3-D Environment with a $2\frac{1}{2}$ -D Map Structure*. In the proceedings of the International Conference on Intelligent Robotics and Systems (IROS), 2003, pp. 2986-2991.
- Crabbe, F.L., *On Learning to Select Actions in Multiple Goal Scenarios*. In the proceedings of the International Conference on Computational Intelligence for Modeling Control and Automation (CIMCA), 2003. pp. 247-257.
- Crabbe, F.L., *Compromise Candidates in Positive Goal Scenarios*. In the proceedings of the Seventh International Conference on Simulation of Adaptive Behavior (SAB), 2002. pp. 105-106.
- Crabbe, F.L., *Multiple Goal Q-Learning: Issues and Functions*. In the proceedings of the International Conference on Computational Intelligence for Modeling Control and Automation (CIMCA), 2001, pp. 179-185.
- Crabbe, F.L., and Dyer M.G., *Observation and Imitation: Goal Sequence Learning in Neurally Controlled Construction Animats: VI-MAXSON*. In the proceedings of the Sixth International Conference on Simulation of Adaptive Behavior (SAB), 2000, pp. 373-382.
- Crabbe, F.L., and Dyer M.G., *Second-order networks for wall-building agents*. In the proceedings of the International Joint Conference on Neural Networks (IJCNN), 1999, #314.
- Crabbe, F.L., and Dyer, M.G., *Vicarious learning in mobile neurally controlled agents: The V-MAXSON architecture*. In the proceedings of the International Conference on Artificial Neural Networks (ICANN), 1999, pp. 904-909.

EDITED VOLUME

- Crabbe, F., Smart, W., Tejada, S. Eds. Proceedings of the AAAI Robot Competition Workshop. 2004.

BOOK REVIEW

- Crabbe, F.L., *Unifying Artificial Intelligence Robotics: An Undergraduate Textbook* Adaptive Behavior, 9(2), 2001, pp. 119-122.

INVITED LECTURES

- Compromise Strategies for Action Selection. Intelligent Systems Program, University of Pittsburgh. March 3, 2006
- Unifying Undergraduate Artificial Intelligence Robotics: Layers Of Abstraction Over Two Channels. AAAI Spring Symposium on Robotics Education, Stanford University. March 22, 2004.
- Artificial Intelligence: Where It's Come From, Where It's Going, and Why It's Hard. Society of American Military Engineers, Annapolis, MD. February 19, 2004.
- Undergraduate Robotics: A New Synthesis. Olin College of Engineering, Needham, MA. April 10, 2003.

Construction and Learning Among Neurally Controlled Animals. Emory University, Atlanta, GA.
March 29, 2000.
Learning and Cooperation in Neurally Controlled Agents. Intel Research Laboratories, Beaverton,
OR. March 23, 1999.

PROFESSIONAL ACTIVITIES

Workshop Chairmanship:

AAAI Robot Competition Workshop 2004

Program Committees:

Modeling Natural Action Selection 2005

Computational Intelligence for Modeling Control and Automation 2004

Genetic and Evolutionary Computation Conference 2002

Session Chairmanships:

Computational Intelligence for Modeling Control and Automation 2003

Computational Intelligence for Modeling Control and Automation 2001

Journal Reviewing:

Philosophical Transactions of the Royal Society, Part B

Adaptive Behavior

IEEE Transactions on Man, Systems, and Cybernetics

Journal of Artificial Societies and Social Simulation

Trends in Cognitive Science

Grant Reviewing:

NIST Advanced Technology Program 05/2004

NIST Advanced Technology Program 06/2002

NIST Advanced Technology Program 10/2002

Other:

Maintainer USENET comp.ai FAQ 3/99-6/05

GRANTS AWARDED

Office of Naval Research 10/05
Grant # N0001406WR2015

Office of Naval Research 10/04
Grant # N0001405WR20042

Office of Naval Research 5/04
Grant # N0001404WR20377

Office of Naval Research 5/03
Grant # N0001403WR20241

Office of Naval Research 5/02
Grant # N0001402WR20367

Office of Naval Research 8/01
Grant # N0001401WR20392

UNIVERSITY SERVICE

Yard:

Graduate Education Committee	2005-2006
Ryan Scholarship coordinator	2002-2004
McMullen Scholarship coordinator	2001-2002,2005
Naval Academy Research Committee	2003-2004

Division:

Trident Committee	2005
Naval Academy Research Committee	2003-2005

Department:

Distinguished Speaker Series Administrator	2005-2006
Robotics administrator	2000-2006
ACM Student Organization Faculty Representative	2002-2006
Faculty Search Committee	2002, 2004-2005
Systems Committee	2003-2004
Research Committee, Chair	2003-2005
Graduate Scholarship Advisor	2000-2002
Curriculum Committee	2001-2002,2005