

BIOGRAPHICAL SKETCH: PAUL FISHWICK

RESEARCH INTERESTS

Modeling, Computer Arts, Computer Simulation

RESEARCH ACCOMPLISHMENTS

The PI developed a methodology for hierarchical model representation and abstraction termed *multimodeling*. Over the past two years, the PI has lead a team to create the *rube* methodology, which specifies a 3D VRML prototype representation of both models and phenomena being modeled. The *rube* methodology is being applied to general purpose software engineering by treating programs as models.

EDUCATION

- (1986) Ph.D. in Computer and Information Science, University of Pennsylvania (Advisor: **Norman I. Badler**)
- (1983) M.S. in Applied Science, College of William and Mary • (1977) B.S. in Mathematics, Pennsylvania State University, College Park

POSITIONS HELD

- August 7, 1998, Professor of Computer and Information Science and Engineering, University of Florida. • August 1991-August 1998, Associate Professor of Computer and Information Science and Engineering, University of Florida. • August 1986-August 1991, Assistant Professor of Computer and Information Science and Engineering, University of Florida. • April 1984-May 1986 Research Assistant, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, Pennsylvania. • September 1983-April 1984 Teaching Assistant, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, Pennsylvania. • January 1981-September 1983 Systems Research Analyst, NASA Langley Research Center (Kentron Technical Center), Hampton, Virginia. • January 1978-December 1980 Programmer Analyst, Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia.

SELECTED RESEARCH FUNDING

- “Integrating Stochastic and Simulation-Based Models into C^3I Automated Planning Tasks” (PI), 1995-1998, United States Air Force (Rome Laboratory) \$293,978. • “A Multimodeling Framework for Complex Multi-Agent Systems” (PI) 1995-1996 United States Air Force (Rome Laboratory), \$116,572. • “Model Component Integration and Development of a Graphical User Interface for the Across Trophic Level System Simulation (ATLSS)” (co-PI), 1995-2000, U.S. Department of the Interior, \$810,000. • “Enhancing Simulation Analysis Reporting Using Natural Language Feedback” (PI) 1989-1991, National Science Foundation Research Initiation Award \$39,000.

HONORS/DISTINCTIONS

- Delivered 8 Keynote Addresses; • Fellow SCS (Society for Computer Simulation); • Senior Member IEEE (Institute for Electrical and Electronics Engineers); • IEEE Computer Society Certificate of Appreciation for Leadership of the Simulation Committee (TCSIM); Two Year Term: June 1988-June 1990; • Received a National Science Foundation Engineering Research Initiation Award (1989); • CIS Department Teacher of the Year Award (1991); • Received a *NASA Certificate of Recognition* for data base machine research (1983); • Listed in *American Men and Women of Science*.

SELECTED PROFESSIONAL ACTIVITIES

- General (or Co) Chair of Five Conferences: 2000 Winter Simulation Conference; Second and Fifth AI, Simulation and Planning in High Autonomy Systems Conference (1991 Cocoa Beach,FL and 1994 Gainesville,FL); Third AI and Simulation Workshop (1988 Minneapolis, MN); First International Conference on Web-Based Modeling and Simulation (1998 San Diego, CA).
- Area Editor of ACM Transactions on Modeling and Computer Simulation (since 1990); Associate Editor of: IEEE Transactions on Systems, Man and Cybernetics (1992-1999); Transactions of the Society of Computer

Simulation; Simulation; Journal of Systems Engineering; International Journal of Computer Simulation; Future Generation Computer Systems; INFORMS Journal of Computing; Journal of General Systems

- Creator and Moderator for 6 years of Internet News Group: `comp.simulation`.
- Guest Editor of five journal issues: SCS Transactions (Qualitative Simulation, Model Abstraction); ACM Transactions on Modeling and Computer Simulation (Visualization); Journal of Systems Engineering (Object Oriented Simulation); Expert Systems with Applications (AI and Simulation).
- Program Committee Member for 20 international workshops and conferences.

TEN SELECTED PUBLICATIONS

- Paul A. Fishwick. "Simulation Model Design and Execution: Building Digital Worlds." Prentice Hall, 1995, 450pp.
- Paul A. Fishwick and Paul A. Luker, Editors. *With a Foreword by Herbert Simon*. "Qualitative Simulation Modeling and Analysis". Springer Verlag, 1991, 330pp.
- Paul A. Fishwick and Richard B. Modjeski, Editors. "Knowledge Based Simulation: Methodology and Application". Springer Verlag, 1991, 294pp.
- Paul A. Fishwick. "The Role of Process Abstraction in Simulation". *IEEE Transactions on Systems, Man and Cybernetics*, Volume 18, Number 1, January/February 1988, pp. 18 – 39.
- Paul A. Fishwick. "Invariance and Nominal Value Mapping as Key Themes for Qualitative Simulation". *SCS Transactions on Simulation*, Volume 7, Number 4, 1991. pp. 339-361.
- Zaiyong Tang and Paul A. Fishwick. "Feed-Forward Neural Nets as Models for Time Series Forecasting". *ORSA Journal of Computing*, Volume 5, Issue 4, 1993, pp. 374-386.
- Paul A. Fishwick and Bernard P. Zeigler. "A Multimodel Methodology for Qualitative Model Engineering". *ACM Transactions on Modelling and Computer Simulation*. Volume 2, Issue 1, 1992, pp. 52-81.
- Paul A. Fishwick, N. H. Narayanan, Jon Sticklen and Andrea Bonarini. "A Multimodel Approach to Reasoning and Simulation." *IEEE Transactions on Systems, Man and Cybernetics*, Volume 24, Issue 10, October 1994, pp. 1433-1449.
- Paul A. Fishwick. "An Integrated Approach to System Modelling using a Synthesis of Artificial Intelligence, Software Engineering and Simulation Methodologies." *ACM Transactions on Modelling and Computer Simulation*. Volume 2, Issue 4, 1992, pp. 307-330.
- Yi-Bing Lin and Paul A. Fishwick. "Asynchronous Parallel Discrete Event Simulation". *IEEE Transactions on Systems, Man and Cybernetics*, Volume 26, Number 4, July 1996, pp. 397-412.

SUMMARY OF PUBLICATIONS

The PI has authored one textbook (Prentice Hall), edited three conference proceedings, and co-edited two books (Springer Verlag). He has published 5 book chapters, 42 refereed journal publications, 33 refereed conference publications, and 22 additional papers.

Ph.D. STUDENTS

- Sheryl Duggins (co-Advisor, Aug. 1989) Professor at Southern Technical College, Marietta, Georgia.
- Stephen Walczak (Dec. 1990); Currently an Associate Professor in the School of Business, University of South Florida, Tampa, Florida.
- Victor Todd Miller, (August 1993); Lead Engineering Analyst at Campbell and Co., Baltimore, Maryland.
- Jin Joo Lee (August 1996); Senior Research Scientist, LSI Logic, San Jose, California.
- Gyooseok Kim (May 1998); Korean Air Force Lieutenant.
- Kangsun Lee (December 1998); Research Scientist, Samsung Electronics, Seoul, Korea.
- Robert Cubert (May 1999); Adjunct Professor, University of Florida, Gainesville, Florida.

CREATIVE PRODUCTS

- **Software:** *ZAP* Terminal Emulator, published by Solution Systems and the Programmer's Shop, Cambridge, Massachusetts (1984-1990). *ZAP* emulated the DEC VT102 and Tektronix 4014 terminals; *SimPack* Simulation Toolkit (1990-present): C++ based Toolkit for both discrete event and continuous simulation. Current mailing list size is 175 addresses worldwide. URL: <http://www.cise.ufl.edu/~fishwick/simpack/simpack.html>; *MOOSE* Simulation Environment (1996-present): C++, Tcl/Tk visual simulation environment for multimodeling,

fuzzy simulation and model abstraction. URL: <http://www.cise.ufl.edu/~fishwick/moose.html>

• **Computer Music:** Featured Artist on Creative Lab's LavaMusic site (www.lavamusic.com) from November 5 through 12, 1999; MP3.COM artist, with online Audio CD, since April 1999: <http://www.mp3.com/fishwick> <http://www.cise.ufl.edu/~fishwick/music/>

• **Computer Art:** Student Art Exhibitor: "Winged Thought", Media: pencil. Pennsylvania State University Art Museum, May 1997, State College, Pennsylvania; Exhibitor, "Koan Heads", Media: computer rendering of 3D model. Orlando Museum of Art: Art and Technology 97: *Beyond the Virtual Edge*, October 31 through November 2, 1997, Orlando, Florida; Artwork (1 image) for the Independent Florida Alligator, Volume 92, Number 155, Thursday, June 10, 1999, page 3; Cover illustration for the Society for Computer Simulation (SCS) journal *Simulation*, Volume 73, Number 1, July 1999. <http://www.cise.ufl.edu/~fishwick/art/>; Experiments in Apple's QuickTime VR Technology: <http://www.cise.ufl.edu/~fishwick/qtvr/>

SYNERGISTIC ACTIVITIES

(93-97) UF Particle Science Center group leader and member • (97-) Everglades modeling project with Wildlife Conservation Dept. • (99-) Chair of Digital Arts and Science Curricula (Art/Music/Engineering) • Member of State of Florida team to audit hurricane models and code (Meteorology/Structures/Actuarial Science/Statistics).