

**Gary L. Haith, Ph.D.**  
3771 Sage Circle  
Evergreen, CO 80439

Phone: (303) 679-1403  
email: [haith@stanfordalumni.org](mailto:haith@stanfordalumni.org)  
web: <http://ic-www.arc.nasa.gov/people/haith>

## SUMMARY

Computer Scientist/Researcher with experience in product development, research, and management seeking position in progressive company that values inspiration, dedication and competence.

Experience and skills include:

- Algorithm Design
- Modeling, Simulation and Visualization
- Machine Learning Algorithms
- Control of Robotic Systems
- Development in MATLAB, C/C++, Python
- CAD Design in Pro/Engineer and Autocad
- Mechanism Prototyping
- Project Management
- Business Development
- Independent and Collaborative Research

## Education:

**Ph.D. in Psychology** Stanford University (Computational Neuroscience emphasis), 1998  
**M.A. in Psychology** Stanford University, 1997  
**B.A. in Anthropology** University of California, San Diego (Biological Anthropology emphasis), 1992

- *Summa Cum Laude*
- *Highest Honors*
- *Phi Beta Kappa*
- *National Merit Scholar*

## Professional Experience:

### **NASA Ames Research Center (Recom Technologies & QSS Group)**

**May 1999 to Present:** - Project Lead, Serpentine Robot Project

**Sept. 1998 to Present:** - Computer Scientist

**Sept. 1997 to Sept. 1998:** - Systems Analyst

Responsible for managing the Serpentine Robot Project (<http://ic-www.arc.nasa.gov/ic/snakebot/>) and for creating and implementing computer simulations, machine learning algorithms, and integrated hardware and software for robotic systems. Project management responsibilities include defining project applications and goals, writing proposals for funding, creating and maintaining collaborations with universities and industrial partners, contracting out specialized engineering and machining tasks, developing a dynamic physical simulation and a mechanical design (including sensing, electronics, and folded metal skeleton), developing a control architecture, and writing up the project for internet and journal/conference publication.

Major accomplishments include:

- Applied for and received Director's Discretionary Fund Grant for collective robotics research (13/70 applications were granted).
- Applied for and received Research Associateship from National Research Council.
- Designed, built and controlled a snake robot that will be one of the first serpentine robots to operate under sensor based, closed-loop control.
- Created a novel co-evolutionary machine learning algorithm and applied it to the design of a rudimentary controller and an analog amplifier circuit.
- Publicized the project in a NASA press release that generated heavy international press interest.
- Implemented Cartesian (inverse kinematics) and force control for the Marsokhod arm to support accurate positioning and instrument placement (<http://img.arc.nasa.gov/Marsokhod/marsokhod.html>).
- Implemented image rotation module and neural movement prediction module to support visual servoing on the Marsokhod rover. Neural module eliminated 50-70% of tracking failures.
- Designed and implemented a dynamic simulation of a legged robot for gait controller design. Ported CAD drawing of the robot to a SGI 3D visualization package.
- Designed inverse models for gene expression networks and robot kinematics.
- Organized and chaired workshop at Neural Information Processing Systems (1998) conference on

*Development And Maturation In Natural And Artificial Systems.*

- Presented and published research results at conferences and in journals.

---

**Kagora, Inc (www.kagora.com)**

**Feb. 2000 to Jan. 2001: - Co-Founder, CTO**

Founder of Kagora, Inc, an enterprise software company which provides a unique knowledge exchange product for Global 10,000 companies. Responsibilities include: executive management, product development, developing product specifications, product management, market analysis, business development, fund-raising, technical and executive hiring, and market simulation (C++).

Major accomplishments include:

- Invented the market algorithms at the core of the product (patent submitted, 3/00).
- Spearheaded key partnerships with technology, legal and beta partners.
- Secured \$300,000 in seed funding from venture capital investors.
- Grew the company over 8 months from 3 to 10 employees.
- Recruited and managed partnerships with world class market theorists.
- Managed the product development through the Alpha launch (10/00).
- Built and analyzed simulations of interacting agents in the market system (C/C++)

---

**Stanford University**

**1993 through 1997**

**- Graduate Research Fellow**

**1995 through 1996**

**- Instructor: Human Neuropsychology, Evolution and Development**

Graduate research involved heading several original research projects including human studies and computer simulations. Research responsibilities included managing research assistants and the design, implementation, analysis, and oral and written presentation of results. Fellowship responsibilities included assisting the teaching of Human Neuropsychology, Introduction to Psychology, Statistics, and Development in Infancy.

Major Accomplishments included:

- Applied for and received a Stanford Graduate Fellowship.
- Designed, implemented, and analyzed a biologically realistic simulation of neural development.
- Accelerated a standard simulation of a developing neural system by a factor of 100.
- Designed and taught two full-length undergraduate courses.

**Other Professional Experience:**

**1995**

**Neural Algorithm Consultant, Dr. Robert Siegler, Carnegie Mellon University**

**Patents:**

- A Contact Sensing Assembly Using Strain Gauges, Primary Author (pending, submitted 11/00)
- Method of Managing an Expert Knowledge Marketplace, Primary Author (pending, submitted 2/00)

### **Selected Papers and Presentations:**

Lohn, J.D. Haith, G.L., Colombano, S.P., & Stassinopoulos, D. (2000), *Towards Evolving Electronic Circuits for Autonomous Space Applications*, Proceedings of the 2000 IEEE Aerospace Conference, Big Sky, MT, March 18-25, 2000.

Lohn, J.D. Haith, G.L., Colombano, S.P., & Stassinopoulos, D. (2000), *A Parallel Genetic Algorithm for Automated Electronic Circuit Design*, Proceedings of the Computational Aerosciences Workshop, NASA Ames Research Center, February, 2000.

Haith, G.L., Colombano, S.P., Lohn, J.D., & Stassinopoulos, D. (1999). *Co-evolution for Problem Simplification*. Proceedings of the Genetic and Evolutionary Computation Conference, Morgan Kaufmann Publishers, pp. 244-251.

Lohn, J.D. Haith, G.L., Colombano, S.P., & Stassinopoulos, D. (1999) *A Comparison of Dynamic Fitness Schedules for Evolutionary Design of Amplifiers*, Proceedings of the First NASA/DoD Workshop on Evolvable Hardware, Pasadena, CA, IEEE Computer Society Press, pp. 87-92.

Haith, G.L., Thomas, H., Wright, A. (1999). *A Serpentine Robot for Planetary and Asteroid Surface Exploration*. Oral Presentation at the Fourth IAA International Conference on Low-Cost Planetary Missions, May 2-5, 2000, Laurel, MD.

Haith, G.L., Colombano, S.P., Haith, M.M., & Elman, J. (1998). *Development and Maturation in Natural and Artificial Structures*. Workshop: Twelfth Annual Conference on Neural Information Processing Systems.

Lohn, J.D., Haith, G.L., & Colombano, S.P. (1998). *Two Electromechanical Self-Assembling Systems*. Poster Presentation: Sixth Foresight Conference on Molecular Nanotechnology.

Haith, G.L. & Heeger, D.J. (1998). *A Computational Model of Retinogeniculate Development*. In Computational Neuroscience: Trends in Research, 1998. J. M. Bower, ed., Plenum, New York, NY.

Lohn, J.D., Colombano, S.P., Scargle, J., Stassinopoulos, D., & Haith, G.L. (1998). *Evolution of Catalytic Reaction Sets Using Genetic Algorithms*, IEEE International Conference on Evolutionary Computation, pp. 487-492.

D. Stassinopoulos, S.P. Colombano, J.D. Lohn, G.L. Haith, J. Scargle, and S. Liang (1998) *Spatial Autocatalytic Dynamics: An Approach to Modeling Pre-biotic Evolution*, Proceedings of the 1998 International Conference of Complex Systems, Nashua, NH.

Haith, G.L. (1997) *Processing Limitations Complement Structural Growth In Building Hierarchical Representations*. Behavioral and Brain Sciences. Dec, 20(4):566 ff.

Haith, G.L. & Heeger, D.J. (1997). *A Model of Spontaneous Activity and Neural Development*. Poster Presentation: Cognitive Science Society.

Haith, G.L. & Heeger, D.J. (1997). *Modeling Refinement in the Retinogeniculate Projection: The Role of Waves*. Poster Presentation: Computational Neuroscience.

Haith, G.L. & Heeger, D.J. (1996). *Retinal Waves Can Produce Retinotopy in a Model of LGN Development Without Long-Range Lateral Connectivity*. Society for Neuroscience Abstracts. 22(1-3):1976.

Haith, G. L. (1994). *Spontaneous Activity and the Development of Neural Maps: A Computational Model*. Presentation: Stanford-Berkeley Symposium on Cognitive Psychology.

**References Available on Request.**