

Vinod K. Valsalam

Research Interests

Artificial Intelligence techniques and applications, e.g. machine learning, evolutionary computing, artificial neural networks, robotics, intelligent agents in games.

Education

Ph.D. candidate in Computer Science (expected May 2010)

The University of Texas at Austin

Advisor: Prof. Risto Miikkulainen

Dissertation: Evolving Symmetric and Modular Neural Networks for Complex Control Problems

M.S. in Computational Engineering (Dec 1998)

Mississippi State University

B.Tech. in Aerospace Engineering (May 1996)

Indian Institute of Technology (IIT), Madras

Awards

Best Paper Award in Artificial Life, Evolutionary Robotics, Adaptive Behavior, and Evolvable Hardware at the Genetic and Evolutionary Computation Conference (GECCO-2008, Atlanta, GA) for Vinod Valsalam and Risto Miikkulainen, “Modular Neuroevolution for Multilegged Locomotion” (2008).

Best Paper Award in A-Life, Evolutionary Robotics, and Adaptive Behavior at the Genetic and Evolutionary Computation Conference (GECCO-2005, Washington, DC) for Vinod Valsalam, James Bednar, and Risto Miikkulainen, “Constructing Good Learners using Evolved Pattern Generators” (2005).

Publications

Journal Papers

Vinod K. Valsalam, James A. Bednar, and Risto Miikkulainen. Developing Complex Systems using Evolved Pattern Generators. *IEEE Transactions on Evolutionary Computation*, 11(2): 181–198, 2007.

Vinod K. Valsalam and Anthony Skjellum. A Framework for High-Performance Matrix Multiplication Based on Hierarchical Abstractions, Algorithms and Optimized Low-Level Kernels. *Concurrency and Computation: Practice and Experience*, 14(10): 805–839, 2002.

Conference Papers

Vinod K. Valsalam and Risto Miikkulainen. Evolving Symmetric and Modular Neural Network Controllers for Multilegged Robots. In *Exploring New Horizons in Evolutionary Design of Robots: Workshop at the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

Vinod K. Valsalam and Risto Miikkulainen. Evolving Symmetric and Modular Neural Networks for Distributed Control. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2009)*, pages 731–738, 2009. (Nominated for **Best Paper Award** in Generative and Developmental Systems.)

Vinod K. Valsalam and Risto Miikkulainen. Modular Neuroevolution for Multilegged Locomotion. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2008)*, pages 265–272, 2008. (Winner of the **Best Paper Award** in Artificial Life, Evolutionary Robotics, Adaptive Behavior, and Evolvable Hardware.)

Vinod K. Valsalam, James A. Bednar, and Risto Miikkulainen. Establishing an Appropriate Learning Bias Through Development. In *Proceedings of the Fifth International Conference on Development and Learning (ICDL-2006)*, 2006.

Vinod K. Valsalam, James A. Bednar, and Risto Miikkulainen. Constructing Good Learners using Evolved Pattern Generators. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2005)*, pages 11–18, 2005. (Winner of the **Best Paper Award** in A-Life, Evolutionary Robotics and Adaptive Behavior.)

Vinod K. Valsalam and Donna Reese. Tools for Improving the Out-of-core Performance of Data and Computation Intensive Applications. In *Proceedings of the 1999 Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS-1999)*, 1999.

Technical Reports

Vinod K. Valsalam. Efficient Indexing Algorithm for Morton Order Storage of 2D Arrays. Technical Report MSSU-COE-ERC-99-3, NSF Engineering Research Center for Computational Field Simulation, Mississippi State University, 1999.

Talks

Invited Talks

“Modular Neuroevolution for Multilegged Locomotion,” *Workshop on Intelligent Systems for Modeling and Control: Advances in Design and Validation, IEEE Multi-conference on Systems and Control (MSC-2008)*, San Antonio, TX, Sep 2008.

“High-performance Matrix Multiplication Based on Hierarchical Storage Formats,” *Department of Computer Sciences, The University of Texas at Austin*, TX, Nov 2001.

“Improved Cache Utilization Using Morton Ordering: An Efficient Index Calculation Method,” *Workshop on Parallel Algorithms, Computational Efficiency and Multiscale Materials Simulations*, New Orleans, LA, Apr 1999.

Conference Talks

“Evolving Symmetric and Modular Neural Networks for Distributed Control,” *Genetic and Evolutionary Computation Conference (GECCO-2009)*, Montreal, Québec, Canada, Jul 2009.

“Establishing an Appropriate Learning Bias Through Development,” *Fifth International Conference on Development and Learning (ICDL-2006)*, Bloomington, IN, Jun 2006.

“Constructing Good Learners using Evolved Pattern Generators,” *Genetic and Evolutionary Computation Conference (GECCO-2005)*, Washington, DC, Jun 2005.

“Tools for Improving the Out-of-core Performance of Data and Computation Intensive Applications,” *Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS-1999)*, Chicago, IL, Jul 1999.

Posters

“Evolving Symmetric and Modular Neural Network Controllers for Multilegged Robots,” *Exploring New Horizons in Evolutionary Design of Robots: Workshop at the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, St. Louis, MO, Oct 2009.

Experience

Research

Graduate Research Assistant (Since Aug 2008; Summer 2005)
Department of Computer Sciences, The University of Texas at Austin, TX

Research Staff Member (Jan 1999 – Aug 2002)
High Performance Computing Laboratory (HPCL), Mississippi State University, Starkville, MS

Graduate Research Assistant (Aug 1996 – Dec 1998)
NSF Engineering Research Center, Mississippi State University, Starkville, MS

Undergraduate Research Assistant (Mar 1994 – Nov 1995)
Indian Institute of Technology (IIT), Madras

Teaching

Graduate Teaching Assistant (Aug 2002 – May 2008)
Department of Computer Sciences, The University of Texas at Austin, TX
– Artificial Intelligence, Machine Learning, Neural Networks, Programming Languages, High-Performance Parallel Computing, Foundations of Computer Science, Computer Organization and Programming, Scientific Computing

Instructor (Spring 2001)
Department of Computer Sciences, Mississippi State University, Starkville, MS
– Operating Systems

Industry

Engineering Intern (Summer 2006)
ITA Software, Cambridge, MA

Open Source

Developer (Summer 2007)
Open BEAGLE (an evolutionary computation framework in C++)
<http://sourceforge.net/projects/beagle/>

Developer (Since Aug 2008)
OpenNERO (a Game Platform for AI Research and Education)
Department of Computer Sciences, The University of Texas at Austin, TX

Service

Journal Reviewer: *Machine Learning*, 2009; *Adaptive Behavior*, 2008; *International Journal of Humanoid Robotics (IJHR)*, 2006.

Conference Reviewer: *ASME 2009 International Design Engineering Technical Conferences (IDETC) & Computers and Information in Engineering Conference (CIE)*, 2009; *IEEE 7th International Conference on Development and Learning (ICDL)*, 2008.

Department Committee: Member of the *Graduate Student Faculty Recruiting Committee*, Spring 2008.

Technical Skills

Programming Languages: C, C++, Java, Lisp/Scheme, OCaml, Fortran, SPARC Assembly

Scripting Languages: Bash, Perl, Python

Operating Systems: Linux, MS Windows, MacOS X, Solaris

Miscellaneous: L^AT_EX, HTML, Matlab, Mathematica, Message Passing Interface (MPI), Qt toolkit

Miscellaneous

Citizenship: India

Visa: F1 (student)