

Abraham Bagherjeiran

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Education

University of Houston, Houston, TX

PhD in Computer Science Anticipated graduation date May 2007 (all but dissertation).

Dissertation title: "Multi-Objective Bias Learning"

Adviser: Ricardo Vilalta.

MS in Computer Science GPA 4.00, Spring 2005.

Thesis title: "Artificial Government: Meta-Learning for Multi-Agent Coordination and Control"

Adviser: Ricardo Vilalta

BS in Computer Science GPA: 3.97, *summa cum laude*, Spring 2003.

Research Experience

Doctoral Candidate Department of Computer Science, University of Houston, 2006-Present

- My dissertation is on multi-objective bias learning, using experience on past learning tasks to find models that optimize multiple objectives on new tasks.

Research Assistant Department of Computer Science, University of Houston, supervisor Ricardo Vilalta, 2003-Present

- Developed open source Java library for machine learning and spatial data mining. Assisted with a data mining course in which students had to use and extend the software.
- Combined meta-learning and distance function learning, applied to content-based image retrieval.
- Reinforcement learning for distance function learning, applied to supervised clustering.
- Feature construction using a genetic algorithm for pattern classification.

Research Intern Lawrence Livermore National Laboratory, 2004-2006, summer.

- Combined image and text features, applied to retrieval of images and their captions, used an iterative query refinement approach, supervisor Nicole Love.
- Investigated graph-based methods for classifying particle orbits, supervisor Chandrika Kamath
- Implemented an anomaly detection library, applied to network intrusion detection of connection traces, supervisor Erick Cantu-Paz.

Honors and Awards

Student Travel Award, Doctoral Consortium at the AAI Conference, 2006.

Student Travel Award, SIAM Data Mining Conference, 2006.

Master's Student Research Award, Department of Computer Science, University of Houston, 2005.

Gordon Davis Memorial Scholarship, 2002.

University of Houston Alumni Scholarship, 1999-2003.

Activities

Reviewer

- Journal of Engineering Applications of Artificial Intelligence, 2006.
- ICDM, supplemental reviewer, 2005.

Open Source Software

- Cougar², created project to develop a Java library for machine learning and spatial data mining, 2006.

ACM Programming Contest

- Led the undergraduate teams that participated in the South Central Regional Contest 2003-2005.
- Participated in the contest, 2002-2003.

Relevant Skills

Programming: Java, 5 years and C++, 6 years. Recently learned Matlab, Python, and Jython.

Machine Learning Algorithms: I have used and implemented: support vector machines, k-nearest-neighbor, Q-Learning (reinforcement learning), k-means clustering, genetic algorithms, decision trees.

Software: I often use the following: Weka, Matlab, octave, gnuplot, R, and L^AT_EX.

Databases: SQL queries in Oracle, PgSQL programming in PostgreSQL, and T-SQL in SQL Server.

Software Development: The Cougar² software project I started uses test-first development with JUnit and mock objects. We follow agile development practices as closely as possible for an open-source project.

Relevant Courses: Optimization, Object-Oriented Analysis and Design, and Game Theory.

Publications

Conference

- Abraham Bagherjeiran and Chandrika Kamath. Graph-based Methods for Orbit Classification. In *Proc. 2006 SIAM Conf. on Data Mining*. 574–577 April 2006.
- Abraham Bagherjeiran and Christoph F. Eick and Chun-Sheng Chen and Ricardo Vilalta. Adaptive Clustering: Obtaining Better Clusters Using Feedback and Past Experience. In *Proc. 5th Int'l Conf. on Data Mining*. 565–568 November 2005. IEEE Computer Society.
- Abraham Bagherjeiran and Ricardo Vilalta and Christoph F. Eick. Content-Based Image Retrieval Through a Multi-Agent Meta-Learning Framework. In *Proc. 17th Int'l Conf. on Tools with Artificial Intelligence*. 24–28 November 2005. IEEE Computer Society.
- Christoph F. Eick and Alain Rouhana and Abraham Bagherjeiran and Ricardo Vilalta. Using Clustering to Learn Distance Functions for Supervised Similarity Assessment. In *Proc. 4th Int'l Conf. Machine Learning and Data Mining in Pattern Recognition*. 120–131 2005. Springer Verlag.
- Ricardo Vilalta and Paul Padley and S. J. Lee and Chaofan Sun and Abraham Bagherjeiran. Evaluating and Constructing Features For Identification of Tau Leptons. In *Proc. Conf. on Statistical Problems in Particle Physics, Astrophysics, and Cosmology*. 130-133 September 2003.

In Collection

- Abraham Bagherjeiran and Christoph F. Eick. Distance Function Learning for Supervised Similarity Assessment. In *Case-Based Reasoning on Signals and Images*. 2007. Springer-Verlag. In press. URL: <http://www.cs.uh.edu/~abagherj/publications/Bagherjeiran07Distance/index.html>

Journal

- Christoph F. Eick and Alain Rouhana and Abraham Bagherjeiran and Ricardo Vilalta. Using Clustering to Learn Distance Functions for Supervised Similarity Assessment. *Engineering Applications of Artificial Intelligence* 19 395–401 June 2006.

Presentation / Poster

- Abraham Bagherjeiran. A Value Theory of Meta-Learning. July 2006. Presented at AAAI/SIGART Doctorial Consortium.
- Abraham Bagherjeiran and Nicole S. Love and Chandrika Kamath and Dale Slone. Combining Image and Text Features to Improve Retrieval. Lawrence Livermore National Laboratory, Summer Student Poster Symposium. August 2006.
- Abraham Bagherjeiran and Chandrika Kamath. Orbit Classification: A Graph-Based Approach. Lawrence Livermore National Laboratory, Summer Student Poster Symposium. August 2005.
- Abraham Bagherjeiran and Erick Cantu-Paz. Design and Implementation of an Anomaly Detector. Lawrence Livermore National Laboratory, Summer Student Poster Symposium. August 2004.

Thesis (MS)

- Abraham Bagherjeiran. Artificial Government: Meta-Learning for Multi-Agent Coordination and Control. University of Houston. 2005.

Workshop

- Abraham Bagherjeiran. A Value Theory of Meta-Learning. In *Proc. 11th AAAI/SIGART Doctorial Consortium in 21st Nat'l Conf. on Artificial Intelligence*. 4–5 July 2006.

Research Interests

Machine Learning: Statistical learning theory, kernel methods, meta-learning and bias-learning.

Other: Information retrieval, clustering, recommender systems, game theory, optimization, and case-based reasoning.

References

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