

Curriculum Vitae

Stephen M. Lee-Urban

Education

Ph.D. Computer Science
Lehigh University
Fall 2005 – May 2012

- Dissertation: *Hierarchical Planning Knowledge for Refining Partial-Order Plans*
- Advisor: Dr. Héctor Muñoz-Avila
- Cumulative G.P.A.: 3.91 / 4.0

M.S. Computer Science
Lehigh University
Spring 2005

- Thesis: *TMK Models to HTNs: Translating Process Models into Hierarchical Task Networks*
- Cumulative G.P.A.: 3.86 / 4.0

B.S. Computer Engineering
Lehigh University
Spring 2003

- Cumulative G.P.A.: 3.87 / 4.0
- Participant in the “Engineering Co-Op” program, a selective program that provides eight months of paid, full-time work experience

Professional Experience

Technical Lead
CaseWorks LLC., through
Georgia Institute of Technology
(for Walt Disney Imagineering)
Winter 2011–Fall 2011

- Technical lead on AI project contracted for Walt Disney Imagineering
- A non-disclosure agreement limits my ability to discuss details
- Responsible for technology-team hiring decisions and management
- Lead on AI design, system architecture, software implementation, and client communication

Research Assistant
Lehigh University
Fall 2004 – Winter 2011

- InSyTe Lab (Intelligent Systems and Technologies)
- My primary research focus is automated plan generation, adaptation, repair, and case-based reasoning
- I also conduct research that evaluates machine learning algorithms in games, and have investigated the translation of planning languages
- I have mentored a number of masters students and undergraduates on research conducted in InSyTe lab, often operating as project manager for their projects
- Collaborations: Universidad Complutense de Madrid, UMD College Park
- Funding sources: NRL, NSF, DARPA

Software Developer
AirClic
<http://www.airclic.com>
Fall 2001, Summers of 2002/4

- Collaborative, rapid-prototype software development with Java, SQL, XSLT, Apache Tapestry, and JUnit
- Responsible throughout software lifecycle including creating requirement specifications, implementation, testing, and code maintenance.
- Multiple device classes: cell phones, pagers, palms, desktops. Server side and client side scripting. LDAP and Oracle data storage and querying. Group email administration. Created custom web application to monitor system status and send email and phone alerts.

Computer Specialist
Strack Associates
Summer/Winter 2000

- Designed, coded, and deployed custom MS Access program to organize and control tax information database
- Functioned as network and systems administrator (hardware/software upgrades)

Teaching Experience

Dean's Teaching Assistant

Lehigh University
Fall 2010

- CSE 17, CSE 18 – Structured Programming and Data Structures
- Lectured select classes (over 10 full lectures), helped design assignments and exams, developed and administered enrichment and "value-adding" experiences, held office hours and graded all material
- The DTA is considered prestigious: must be nominated and selected through interviews and is only available to one PhD student per department

Instructor of Record

Lehigh University
Summer 2010

- CSE 15 – Introduction to Computer Science (4 credit, non-elective course)
- Responsibilities: Complete responsibility over the course including the design of syllabus and all course content, daily teaching, and running weekly lab
- Student evaluation of my efficacy as teacher: 5.0/5.0 (highest)

Teaching Assistant

Lehigh University
Fall 2003, Spring 2004

- CSE 12, CSE 15, CSE 16, CSE 17, CSE 197, CSE 327, and CSE 342
- Course descriptions:
 - senior and graduate level network and network-programming
 - sophomore level C++ programming
 - senior level introduction to artificial intelligence
- Responsibilities included fast and proficient debugging of students' C and C++ programs, conducting weekly labs, constructively critiquing and grading programs, teaching select lectures, and one-on-one tutoring of students

Research Interests

Automated Planning

- My dissertation topic is in this area which includes automated plan generation, repair, and adaptation, with an emphasis in partial-order planning and a form of hierarchical planning knowledge (akin to HTN planning).

Game AI

- Not only are games among the most complex and interesting software systems, they act as excellent "simulators" in which to test AI. I have evaluated much of my non-planning, scientific AI research in games.

Case-based Reasoning and Machine Learning

- Reinforcement learning and case-based reasoning approaches have proven to be effective in my experience, impressing me with their real-world applicability.

Software Agents

- I haven't formally studied this field beyond a graduate course, however I find software agents fascinating. My approach to evaluate AI algorithms in games has often been to create "bots" (non-player characters), which are a form of software agents.

Publications

Conference Papers

- Zook, A., Lee-Urban, S., Riedl, M., Holden, H., Sottolare, R., and Brawner, K. (2012) Automated Scenario Generation: Toward Tailored and Optimized Military Training in Virtual Environments. *Proceedings of the 7th International Conference on the Foundations of Digital Games*, Raleigh, North Carolina, 2012.
- Gillespie, K., Karneeb, J., Lee-Urban, S., and Munoz-Avila, H. (2010) Imitating Inscrutable Enemies: Learning from Stochastic Policy Observation, Retrieval and Reuse. *Proceedings of the 18th International Conference on Case Based Reasoning (ICCBR 2010)*. Springer.
- Lee-Urban, S., Munoz-Avila, H. (2009) Adaptation Versus Retrieval Trade-Off Revisited: an Analysis of Boundary Conditions. In *Proceedings of the 8th International Conference on Case-Based Reasoning (ICCBR-09)*. Springer.
- Auslander, B., Lee-Urban, S., Hogg, C., and Munoz-Avila, H. (2008) Recognizing The Enemy: Combining Reinforcement Learning with Strategy Selection using Case-Based Reasoning. In *Proceedings of the 9th European Conference on Case-Based Reasoning (ECCBR-08)*. Springer.
- Vasta, M., Lee-Urban S. & Muñoz-Avila, H. (2007) RETALIATE: Learning Winning Policies in First-Person Shooter Games. In *Proceedings of the Seventeenth Innovative Applications of Artificial Intelligence Conference (IAAI-07)*. AAAI Press.
- Warfield, I., Hogg, C., Lee-Urban, S., Muñoz-Avila, H. (2007) Adaptation of Hierarchical Task Network Plans. In *Proceedings of the Twentieth Flairs International Conference (FLAIRS-07)*. AAAI Press.
- Lee-Urban, S. Muñoz-Avila, H. (2006) A study of Process Languages for Planning Tasks. In *Proceedings of the sixteenth International Conference on AI Planning and Scheduling (ICAPS-06) Doctoral Consortium*.
- Hoang, H., Lee-Urban, S., and Muñoz-Avila, H. (2005) Hierarchical Plan Representations for Encoding Strategic Game AI. In *Proceedings of Artificial Intelligence and Interactive Digital Entertainment Conference (AIIDE-05)*. AAAI Press.

Book Chapters

- Hogg, C., Lee-Urban, S., Muñoz-Avila, H., Auslander, B., Smith, M. Game AI for Domination Games. In Pedro Gonzales Calero (Ed.) *Artificial Intelligence for Computer Games*. Springer Verlag, 2011.
- Lee-Urban, S., Smith, M. & Munoz-Avila, H. 2008. Learning Winning Policies in Team-Based First-Person Shooter Games. *AI Game Programing Wisdom 4*. Charles River Media.

Theses

- Lee-Urban, S. Hierarchical Planning Knowledge for Refining Partial-Order Plans. Doctoral Thesis, 2012.
- Lee-Urban, S. TMK Models to HTNs: Translating Process Models into Hierarchical Task Networks. Master's thesis, 2005.

Workshop Papers

- Zook, A., Lee-Urban, S., Drinkwater, M., and Riedl, M. (2012) Skill-based Mission Generation: A Data-driven Temporal Player Modeling Approach. In *Proceedings of the 3rd Workshop on Procedural Content Generation in Games*, Raleigh, North Carolina, 2012.
- Li, B., Lee-Urban, S., Appling, D.S., and Riedl, M. (2012) Automatically Learning to Tell Stories about Social Situations from the Crowd. In *Proceedings of the LREC 2012 Workshop on Computational Models of Narrative*, Istanbul, Turkey, 2012.
- Hogg, C., Lee-Urban, S., Auslander, B., and Munoz-Avila, H. (2008) Discovering Feature Weights for Feature-Based Indexing of Q-Tables. In *Proceedings of the Uncertainty and Knowledge Discovery in CBR Workshop at the 9th European Conference on Case-Based Reasoning (ECCBR-08)*.
- Sanchez-Ruiz, A., Lee-Urban, S., Muñoz-Avila, H., Diaz-Agude, B., & Gonzalez-Calero, P. (2007) Game AI for a Turn-based Strategy Game with Plan Adaptation and Ontology-based retrieval. In *Proceedings of*

the workshop on Planning in Games at the International Conference on Automated Planning and Scheduling (ICAPS-07).

- Lee-Urban, S., Parker, A., Kuter, U., Muñoz-Avila, H., & Nau, D. (2007) Transfer Learning of Hierarchical Task-Network Planning Methods in a Real-Time Strategy Game. In *Proceedings of the AI Planning and Learning Workshop (AIPL) at the International Conference on Automated Planning and Scheduling (ICAPS-07)*.
- Ponsen, M., Lee-Urban, S., Muñoz-Avila, H., Aha, D., and Molineaux, M. (2005) Stratagus: An Open-Source Game Engine for Research in Real-Time Strategy Games. *Workshop for International Joint Conference on Artificial Intelligence (IJCAI-05)*.

Honors and Awards

- Fall 2010 – Spring 2011
- **Recipient**, Dean’s Teaching Assistant. An honor awarded to advanced Ph.D. students with a demonstrated interest in teaching at the university level who possess skills needed to provide high quality assistance in the classroom
- 2008
- **Recipient**, Graduate Student Life Leadership Award. Given for “exemplary scholarship, leadership, and service to the Lehigh graduate student community
 - **Awarded Membership**, Rossin Doctoral Fellows Program (RDF). The RDF program recognizes high potential Ph.D. candidates who are interested in pursuing academic careers, and helps members hone their teaching skills, present research and attend conferences
- 2006
- **Recipient**, ICAPS Doctoral Consortium Scholarship
- Fall 2003 – Spring 2004
- **Recipient**, Presidential Scholarship at Lehigh University. Given for “outstanding academic achievement by undergraduate students”
 - **Member**, Tau Beta Pi Engineering Honor Society
 - **Two-time Recipient**, American Legion School Award. The award is given to the outstanding student graduating from Junior and Senior High Schools who exhibit exceptional scholarship, leadership, service and honor

Service

- Fall 2010 – Summer 2011
- **Chair**, Computer Science and Engineering Department’s Graduate Research Seminar Series
 - **Volunteer**, student panel for the Computer Science and Engineering accreditation process
- Fall 2009 – Spring 2010
- **Search Committee Member**, for the position of Vice President and Associate Provost for Research and Graduate Studies (sole Graduate Student)
- Fall 2007 – Spring 2010
- **Executive-board Member**, Graduate Student Senate (Communications Officer)
- 2008
- **Volunteer**, IT Infrastructure Planning Committee
 - **Host**, Board of Trustees’s “experiential learning” visit
 - **Graduate Student Representative**, Engineering Advisory Board
- 2007
- **Orientation Ambassador**, incoming Fall 2007 graduate students
 - **Member**, Computer Science and Engineering Advisory Board
- Fall 2006 – Spring 2007
- **Representative** of Computer Science Department, Graduate Student Senate
- Fall 2004 – Present
- **Reviewer**, conference publications including AAAI, FLAIRS, ICCBR, ECCBR, and ICAPS