

# SALEEMA AMERSHI

Computer Science & Engineering  
University of Washington  
samershi@cs.washington.edu  
(206) 669-0351

## RESEARCH INTERESTS

---

I am broadly interested in human-computer interaction and the intersection of human-computer interaction and machine learning, including improving human interaction with machine learning algorithms, machine learning-based applications, intelligent interfaces and user modeling.

The focus of my dissertation is on advancing our understanding of *how to design effective end-user interaction with machine learning*. I have explored this question by designing, developing and evaluating new interaction techniques for everyday people to train machine learning applications in a variety of domains. Concrete examples from my work include designing techniques for people to train machine learning applications to automatically recognize user-defined classes of images, construct in-context access control groups in online social networks and categorize computer network alarms to defend against network failures and attacks.

<http://www.cs.washington.edu/homes/samershi/>

## EDUCATION

---

- 2007–  
Expected  
July 2012      **Ph.D. Computer Science**  
University of Washington, Seattle, WA  
Advisor: Professor James Fogarty  
Thesis: *Designing for Effective End-User Interaction with Machine Learning*
- 2004-2006      **M.Sc. Computer Science**  
University of British Columbia, Vancouver, BC  
Advisor: Professor Cristina Contai  
Thesis: *Combining Unsupervised and Supervised Machine Learning to Build User Models for Intelligent Learning Environments*
- 1999-2004      **B.Sc. Computer Science & Mathematics (Double Major)**  
University of British Columbia, Vancouver, BC

## REFEREED ARTICLES

---

- 2012      [P.19] **Amershi, S.**, Mahmud, J., Nichols, J., Lau, T. and Ruiz, G.A. (2012) LiveAction: Automating Web Task Model Generation. Submitted to *ACM Transactions on Interactive Intelligent Systems* (TIIS).
- [P.18] **Amershi, S.**, Fogarty, J. and Weld, D.S. (2012) ReGroup: Interactive Machine Learning for On-Demand Group Creation in Social Networks. To Appear in *Proceedings of the ACM Conference on Human Factors in Computing Systems* (CHI 2012). (Acceptance rate: 23%)
- 2011      [P.17] **Amershi, S.**, Lee, B., Kapoor, A., Mahajan, R. and Christian, B. (2011) Human-Guided Machine Learning for Fast and Accurate Network Alarm Triage. *Proceedings of the International Joint Conference on Artificial Intelligence* (IJCAI 2011), Best Papers from Sister Conferences Track, pp. 2564-2569.  
*Invited Paper.*

- [P.16] **Amershi, S.**, Fogarty, J., Kapoor, A. and Tan, D. (2011) Effective End-User Interaction with Machine Learning. *Proceedings of the AAAI Conference on Artificial Intelligence* (AAAI 2011), Nectar Track, pp. 1529-1532. (Acceptance rate: 31%)
- [P.15] **Amershi, S.**, Lee, B., Kapoor, A., Mahajan, R. and Christian, B. (2011) CueT: Human-Guided Fast and Accurate Network Alarm Triage. *Proceedings of the ACM Conference on Human Factors in Computing Systems* (CHI 2011), pp. 157-166. (Acceptance rate: 25%) **Best Paper Nominee. Invited to IJCAI 2011.**
- 2010 [P.14] Chen, J., **Amershi, S.**, Dhananjay, A. and Lakshmi, S. (2010) Comparing Web Interaction Models in Developing Regions. *Proceedings of the ACM Symposium on Computing for Development* (DEV 2010).
- [P.13] **Amershi, S.**, Fogarty, J., Kapoor, A. and Tan, D. (2010) Examining Multiple Potential Models in End-User Interactive Concept Learning. *Proceedings of the ACM Conference on Human Factors in Computing Systems* (CHI 2010), pp. 1357-1360. (Acceptance rate: 22%)
- [P.12] **Amershi, S.** and Conati, C. (2010) Automatic Recognition of Learner Types in Exploratory Learning Environments. *Handbook of Educational Data Mining, Chapter 15*. Data Mining and Knowledge Discovery Series (eds. R. Cohen and V. Kumar), Chapman & Hall/CRC Press.
- [P.11] **Amershi, S.**, Morris, M. R., Moraveji, N., Balakrishnan, R., and Toyama, K. (2010) Multiple Mouse Text Entry for Single-Display Groupware. *Proceeding of the ACM Conference on Computer Supported Cooperative Work* (CSCW 2010), pp. 169-178. (Acceptance rate: 20%) **Best Paper Nominee.**
- 2009 [P.10] **Amershi, S.**, Fogarty, J., Kapoor, A. and Tan, D. (2009) Overview-Based Examples Selection in Mixed-Initiative Interactive Concept Learning. *Proceeding of the ACM Symposium on User Interface Software and Technology* (UIST 2009), pp. 247-256. (Acceptance rate: 17%)
- [P.9] **Amershi, S.** and Conati, C. (2009) Combining Unsupervised and Supervised Machine Learning to Build User Models for Exploratory Learning Environments. *The Journal of Educational Data Mining* 1, 2 (Fall 2009).
- [P.8] Hoffmann, R., **Amershi, S.**, Patel, K., Wu, F., Fogarty, J., and Weld, D.S. (2009) Amplifying Community Content Creation with Mixed-Initiative Information Extraction. *Proceedings of the ACM Conference on Human Factors in Computing Systems* (CHI 2009), pp. 1849-1858. (Acceptance rate: 24%) **Best Paper Nominee.**
- 2008 [P.7] Weld, D.S., Wu, F., Adar, E., **Amershi, S.**, Fogarty, J., Hoffmann, R., Patel, K., and Skinner, M. (2008) Intelligence in Wikipedia. *Proceedings of the AAAI Conference on Artificial Intelligence* (AAAI 08), Senior Papers Track, pp. 1609-1614. (Acceptance rate: 40%)
- [P.6] **Amershi, S.** and Morris, M.R. (2008) CoSearch: A System for Co-located Collaborative Web Search. *Proceedings of the ACM Conference on Human Factors in Computing Systems* (CHI 2008), pp. 1647-1656. (Acceptance rate: 22%)
- [P.5] **Amershi, S.**, Carenini, G., Conati, C., Mackworth, A., and Poole, D. (2008) Pedagogy and Usability in Interactive Algorithm Visualizations - Designing and Evaluating CIspace. *Interacting with Computers - The Interdisciplinary Journal of Human-Computer Interaction* 20 (1): pp. 64-96.

- 2007 [P.4] Conati, C., Merten, C., **Amershi, S.**, and Muldner, K. (2007) Using Eye-tracking Data for High-Level User Modeling in Adaptive Interfaces. *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 07)*, Nectar Track pp. 1614-1617. (Acceptance rate: 17%)
- [P.3] **Amershi, S.** and Conati, C. (2007) Unsupervised and Supervised Machine Learning in User Modeling for Intelligent Learning Environments. *Proceedings of the ACM/SIGCHI Conference on Intelligent User Interfaces (IUI 2007)*, pp. 72-81. (Acceptance rate: 22%)
- 2006 [P.2] **Amershi, S.** and Conati, C. (2006) Automatic Recognition of Learner Groups in Exploratory Learning Environments. *Proceedings of Intelligent Tutoring Systems (ITS 2006)*, pp. 463-472. (Acceptance rate: 32%)
- 2005 [P.1] **Amershi, S.**, Arksey, N., Carenini, G., Conati, C., Mackworth, A., Maclaren, H., and Poole, D. (2005) Designing CIspace: Pedagogy and Usability in a Learning Environment for AI. *Proceedings of the ACM/SIGCSE Conference on Innovation and Technology in Computer Science Education (ITiCSE 2005)*, pp. 178-182. (Acceptance rate: 33%)

## REFEREED WORKSHOP PAPERS

---

- 2008 [W.3] **Amershi, S.** and Morris, M.R. (2008) CoSearch: Leveraging Multiple Devices to Enhance Collaboration in Resource-Constrained Environments. *The ACM Conference on Human Factors in Computing Systems Workshop on HCI for Community and International Development (CHI 2008)*.
- [W.2] Morris, M.R. and **Amershi, S.** (2008) Shared Sensemaking: Enhancing the Value of Collaborative Web Search Tools. *The ACM Conference on Human Factors in Computing Systems Workshop on Sensemaking (CHI 2008)*.
- 2006 [W.1] **Amershi, S.**, Conati, C. and Maclaren, H. (2006) Using Feature Selection and Unsupervised Clustering to Identify Affective Expressions in Educational Games. In *Proceedings of The Intelligent Tutoring Systems Workshop on Motivational and Affective Issues in ITS (ITS 2006)*, pp. 21-28.

## REFEREED DEMOS AND POSTERS

---

- 2009 [D.4] **Amershi, S.**, Fogarty, J., Kapoor, A., and Tan, D. (2009) Designing for End-User Interactive Concept Learning in CueFlik. *Workshop on Analysis and Design of Algorithms for Interactive Machine Learning at NIPS 2009 (ADA-IML at NIPS 2009)*.
- [D.3] **Amershi, S.** and Morris, M.R. (2009) Co-located Collaborative Web Search: Understanding Status Quo Practices. *The ACM Conference on Human Factors in Computing Systems – Extended Abstracts (CHI 2009)*.
- 2008 [D.2] Hoffmann, R., **Amershi, S.**, Patel, K., Wu, F., Fogarty, J., and Weld, D.S. (2008) Amplifying Community Content Creation with Mixed-Initiative Information Extraction. *The ACM Symposium on User Interface Software and Technology (UIST 2008)*.
- [D.1] **Amershi, S.**, Morris, M.R. (2009) CoSearch: A System for Co-located Collaborative Web Search. *Microsoft Research's TechFest (TechFest 2008)*.

## PATENTS

---

- 2011 [T.5] **Amershi, S.**, Lau, T.A., Mahmud, J.U. and Nichols, J.W. (2011) Automated Web Task Procedures Based on an Analysis of Actions in Web Browsing History Logs. Pending.
- [T.4] Lee, B., Kapoor, A., Mahajan, R., Christian, B. and **Amershi, S.** (2011) Interactive Machine Learning for Stream-Based Data Triage. Pending.
- 2009 [T.3] Morris, M.R., **Amershi, S.**, Moraveji, N. and Balakrishnan, R. (2009) Multiple Mouse Character Entry. Pending.
- [T.2] **Amershi, S.** and Morris, M.R. (2008) System and Interface for Co-located Collaborative Web Search. Pending.
- 2008 [T.1] Morris, M.R., Teevan, J., **Amershi, S.**, and Mickens, J. (2008) Using Related Users' Data to Enhance Web Search. Pending.

## SELECTED PRESS

---

- 2008 [S.3] Searching as a Team. *MIT Technology Review*, March 2008.  
<http://www.technologyreview.com/Infotech/20405/?nlid=936&a=f>
- [S.2] Microsoft Research Shows New Search Projects. *Seattle Post-Intelligencer*, March 2008.  
<http://blog.seattlepi.nwsourc.com/microsoft/archives/133413.asp>
- [S.1] Microsoft Shows Off Collaborative Search Tools. *InfoWorld*, March 2008.  
[http://www.infoworld.com/article/08/03/04/Microsoft-shows-off-collaborative-search-tools\\_1.html](http://www.infoworld.com/article/08/03/04/Microsoft-shows-off-collaborative-search-tools_1.html)

## RESEARCH EXPERIENCE

---

- 2007–  
Present **University of Washington, Seattle, WA**  
Computer Science & Engineering Department  
*Graduate Research Assistant*  
Advisor: James Fogarty  
Investigating the design of effective end-user interaction with machine learning systems.  
[P.18], [P.17],[P.16], [P.13], [P.10], [P.8], [P.7], [D.4], [D.2]
- Fall 2011 **Google, Mountain View, CA**  
*Research Intern*  
Host: Ed Chi  
Exploring end-user interactive machine learning in the context of online social networks.
- Fall 2010 **IBM Research, Almaden, CA**  
*Research Intern*  
Host: Jalal Mahmud and Tessa Lau  
Developed LiveAction, an automatic machine-learning-based approach to building personal Web task models.  
[P.19], [T.5]

- Summer 2010 **Microsoft Research, Redmond, WA**  
*Research Intern*  
 Host: Bongshin Lee  
 Combined interactive machine learning and novel visualizations in CueT, a system for network alarm triage.  
 [P.17], [P.15], [T.4]
- Summer 2008 **Microsoft Research, Bangalore, India**  
*Research Intern*  
 Host: Kentaro Toyama  
 Explored mouse-based text entry techniques for single-display groupware used in underserved classrooms.  
 [P.11], [T.3]
- Summer 2007 **Microsoft Research, Redmond, WA**  
*Research Intern*  
 Host: Merrie Morris  
 Created CoSearch, a tool for co-located collaborative Web search in resource constrained environments.  
 [P.6], [W.3], [W.2], [D.3], [D.1], [T.2], [S.3], [S.2], [S.1]
- 2005-2006 **University of British Columbia, Vancouver, BC**  
 Laboratory for Computational Intelligence  
*Graduate Research Assistant*  
 Advisor: James Fogarty  
 Developed a machine learning framework for building user models for adaptive educational technologies.  
 [P.12], [P.9], [P.4], [P.3], [P.2], [W.1]
- 2003-2005 **University of British Columbia, Vancouver, BC**  
 Laboratory for Computational Intelligence  
*Undergraduate Research Assistant*  
 Advisor: Alan Mackworth and David Poole  
 Managed and developed AIspace ([www.aispace.org](http://www.aispace.org)), tools for exploring Artificial Intelligence algorithms.  
 [P.5], [P.1]

## TEACHING EXPERIENCE

---

- Spring 2007 **Advanced Topics in HCI (CSE 510)**  
 University of Washington, Computer Science & Engineering  
*Graduate Teaching Assistant for Professor James Fogarty*
- Winter 2007 **Software Engineering (CSE 403)**  
 University of Washington, Computer Science & Engineering  
*Graduate Teaching Assistant for Marty Stepp*
- 2001-2003 **Alma Mater Society (AMS) Tutoring Services**  
 University of British Columbia  
*Tutor (Math, Physics, Chemistry and English)*
- Summer 2002 **Software Engineering (CSE 403)**  
 University of British Columbia, Computer Science  
*Undergraduate Teaching Assistant for Andrew Warfield*

## PROFESSIONAL SERVICE

---

Program Committee	CHI 2012, Steering Committee for Workshop on End-User Interactions with Intelligent and Autonomous Systems CHI 2011, Assistant to General Chair UIST 2010-2011, Poster Committee AAAI 2010, Organizing Committee for Symposium on Artificial Intelligence for Development UIST 2009, Student Volunteer Co-Chair
Reviewer	CHI 2008-2012 EuroVis 2012 ACM Transactions on the Web 2012 ACM Transactions on Interactive Intelligent Systems 2011 UbiComp 2011 UIST 2008, 2010 IEEE Pervasive Computing 2009 – Special Issue on Smarter Phones Pervasive 2009 EDM Handbook 2009
Student Volunteer	IJCAI 2009 Workshop on Intelligence and Interaction UIST 2008
University Service	DUB Student Coordinator, 2008-2009 UW CSE Student Life Survey Coordinator, 2008-2009 UW CSE Prospective Student Committee Member, 2008
Outreach Service	Founder of Women’s Meeting Group, MSR India, Bangalore, India, 2008 Women in Science & Technology Speaker, Women in Leadership (WIL) Foundation, Vancouver, BC, 2005 Remedial Elementary and High School Science Teacher, The Learning Center, Burnaby, BC, 2001-2002

## HONORS AND AWARDS

---

2011	Invited Paper (Invited as best of CHI 2011), IJCAI 2011 Best Paper Nominee, CHI 2011 Kumar & Roberta L. Bhasin Endowed Fellowship Recipient (\$6000 US), Academic Fellowship
2010	Best Paper Nominee, CSCW 2010 Facebook Fellowship Finalist (\$500 US), Institutional Fellowship Microsoft Research PhD Fellowship Finalist, Institutional Fellowship
2009	Google Anita Borg Scholarship Recipient (\$10,000 US), National Research Award Best Paper Nominee, CHI 2009 Google Workshop for Women Engineers Invitee Microsoft Research/Live Labs PhD Fellowship Finalist, Institutional Fellowship
2007-2008	Microsoft Endowed Fellowship (\$18,000 US), Institutional Fellowship
2005-2006	University Graduate Fellowship (\$16,000 CAD), Academic Fellowship
2004	NSERC Undergraduate Research Award (\$10,000 CAD), National Research Award
2003	NSERC Undergraduate Research Award (\$10,000 CAD), National Research Award