

**George M. Ferguson**  
**Associate Professor (Instruction)**  
**Co-Director of Undergraduate Program**  
**Dept. of Computer Science**  
**University of Rochester**  
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In my research career, I worked at the intersection of human-computer interaction and intelligent decision support, designing and building computer systems that interact naturally to help people solve problem.

- 25+ years of research experience developing such systems, 50+ research publications
- Proposed, received, and managed multi-million-dollar projects from agencies including DARPA, ONR, NSF, and NIH
- Program Chair, AAAI-2004, Outstanding Paper award, AAAI-2007

**Director of Media Arts and Innovation Center**

- Developed interdisciplinary curriculum and projects that took advantage of the Center's facilities

**Instructor, Computer Science Department**

- Introductory and advanced courses including CS1, CS3, Web, and Intro to Artificial Intelligence
- Co-director of Undergraduate program
- UR Students' Association 2018-2019 Professor of the Year in Engineering and Applied Sciences

**Education**

University of Rochester	Ph.D.	1995	Computer Science
University of Rochester	M.S.	1991	Computer Science
University of Alberta	M.S.	1989	Computing Science Jeffrey R. Sampson Prize, Dept. Scholarship
McGill University	B.Sc.	1987	Math and Computer Science ( <i>Magna Cum Laude</i> ) Faculty Scholar, McConnell Award

**Employment**

2018-	Associate Professor (Instruction), Co-Director of Undergraduate Program Dept. of Computer Science, University of Rochester
2015-2017	Senior Lecturer, Assoc. Director of Undergraduate Studies Dept. of Computer Science, University of Rochester
2013-2015	Director of Programming and Operations, Ronald Rettner Hall for Media Arts and Innovation University of Rochester
1997-2013	Research Scientist, University of Rochester
1995-1997	Post-doctoral Researcher, Research Associate, University of Rochester
1990-1994	Research Assistant, University of Rochester

## Research

Developed Intelligent Conversational Assistants based on deep, formal models of natural language understanding and collaboration and applied these to problems ranging from logistics to health care to command and control.

Areas of Expertise: Artificial intelligence; Intelligent agents: agent communication languages, agent architectures; User interfaces: speech recognition, natural language understanding, dialogue, conversational agents; User-centered design; Temporal reasoning: representation, planning, scheduling; Semantic web: ontologies, knowledge-based systems; Medical informatics: electronic medical records, personal health records, patient-centered care, self-care technologies, decision support.

## Teaching

At the undergraduate level, I have regularly taught Introductory Programming (Java, Python, Javascript), Web Development, Formal Models (“CS3”), and Artificial Intelligence. I have taught a variety of subjects related to my research at the graduate level. I have also been involved in teaching computing to middle school and high school students, as well as helping high school teachers teach computing.

UR Students’ Association 2018-2019 **Professor of the Year** in Engineering and Applied Sciences.

## Selected Awards and Honors

- Outstanding Paper, Twenty-Second National Conference on Artificial Intelligence (AAAI-2007)
- Program co-Chair, Nineteenth National Conference on Artificial Intelligence (AAAI-2004)
- Invited participant, CCC-NSF-NIH Symposium on Computing and Health: New Opportunities and Directions, 2012
- Program Committee, AAAI Spring Symposium on AI and Health Communication, 2011
- Organizer, AAAI 2007 Spring Symposium on Intentions in Intelligent Systems
- Invited participant, Robert Wood Johnson Synergy Workshop on Technology for Self-Care and Self-Monitoring, 2005
- Program Committees: AAAI, IJCAI, KCAP, UIST, IUI, PRICAI, ...
- Panelist/Reviewer: National Science Foundation (NSF), academic and SBIR programs

## Publications

1. Lasecki, W. S., Weingard, L., Ferguson, G., and Bigham, J. P. (2014). Finding Dependencies Between Actions Using the Crowd. *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI-2014)*. Toronto, Canada.
2. Lasecki, W. S., Weingard, L., Bigham, J. P., and Ferguson, G. (2013). Crowd formalization of action conditions. Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI-13), Student Abstracts. Bellevue, WA.
3. Lasecki, W. S., Weingard, L., Bigham, J. P., and Ferguson, G. (2013). Finding action dependencies using the crowd. International Conference on Knowledge Capture (KCAP-2013), Posters. Banff, Canada.
4. Swift, M., Ferguson, G., Galescu, L., Chu, Y., Harman, C. Jung, H., Perera, I., Song, Y. S., Allen, J., and Kautz, H. (2012). A multimodal corpus for integrated language and action. *Proceedings of the International Workshop on MultiModal Corpora for Machine Learning*, Istanbul, Turkey.
5. Blaylock, N., de Beaumont, W., Galescu, L., Jung, H., Allen, J., Ferguson, G., and Swift, M. (2012). Play-by-play learning for textual user interfaces. In *Applied Natural Language Processing: Identification, Investigation, Resolution*. McCarthy, P. M., and Boonthum-Denecke, C. (eds.). IGI Global.
6. Ferguson, G., and Allen, J. (2011). A Cognitive Model for Collaborative Agents. *Proceedings of the AAAI 2011 Fall Symposium on Advances in Cognitive Systems*. Washington, DC, November.

7. Ferguson, G., Quinn, J., Horwitz, C., Swift, M., Allen, J., and Galescu, L. (2010). Towards A Personal Health Management Assistant. *Journal of Biomedical Informatics* 43(5): S13-S16.
8. Jung, H., Allen, J., de Beaumont, W., Blaylock, N., Ferguson, G., Galescu, L., Swift, M. (2010). Going Beyond PBD: A Play-by-Play and Mixed-initiative Approach. *No Code Required: Giving Users Tools to Transform the Web*, Cypher, A., Dontcheva, M., Lau, T., and Nichols, J. (eds.). Morgan Kaufmann.
9. Blaylock, N., de Beaumont, W., Galescu, L., Jung, H., Allen, J., Ferguson, G., and Swift, M. (2010). Learning Collaborative Tasks on Textual User Interfaces. *Proceedings of the Twenty-Third International Florida Artificial Intelligence Research Society Conference (FLAIRS-23)*. Daytona Beach, FL. May 19-21.
10. Ferguson, G., Allen, J., Galescu, L., Quinn, J., and Swift, M. (2009). CARDIAC: An Intelligent Conversational Assistant for Chronic Heart Failure Patient Health Monitoring. *Proceedings of the AAAI Fall Symposium on Virtual Healthcare Interaction*, Arlington, VA, November.
11. Galescu, L., Allen, J., Ferguson, G., Quinn, J., and Swift, M. (2009). Speech Recognition in a Dialogue System for Patient Health Monitoring. *Proceedings of the IEEE International Conference on Bioinformatics & Biomedicine (BIBM-2009) Workshop on NLP Approaches for Unmet Information Needs in Health Care Submission*, Washington, DC, November.
12. Jung, H., Allen, J., de Beaumont, W., Blaylock, N., Ferguson, G., Galescu, L., and Swift, M. (2009) Going beyond PBD: A Play-by-Play and Mixed-initiative Approach. *Proceedings of the CHI Workshop on End User Programming for the Web*, Boston, MA, April.
13. Ferguson, G., and Allen, J. (2007). Mixed-Initiative Dialogue Systems for Collaborative Problem-Solving. *AI Magazine* 28(2):23-32, Special Issue on Mixed-Initiative Assistants. AAAI Press.
14. Allen, J., Chambers, N., Ferguson, G., Galescu, L., Jung, H., Swift, M., and Taysom, W. (2007). PLOW: A Collaborative Task Learning Agent. *Proceedings of the Twenty-Second Conference on Artificial Intelligence (AAAI-07)*. Vancouver, Canada, Jul 22-26. Outstanding paper award winner.
15. Allen, J., Ferguson, G., Blaylock N., Byron, D., Chambers, N., Dzikovska, M., Galescu, L., and Swift, M. (2006). Chester: Towards a Personal Medication Advisor. *Journal of Biomedical Informatics*, Special Issue on Dialog Systems for Health Communication, 39(5):500-513. Elsevier.
16. Ferguson, G., and Allen, J. (2005). Mixed-Initiative Dialogue Systems for Collaborative Problem-Solving. *Proceedings of the AAAI Fall Symposium on Mixed-Initiative Problem Solving Assistants*, Washington, DC, Nov 4 - 6. AAAI Press.
17. Brown, C.M., Ferguson, G., Barnum, P., Hu, B., and Costello, D. (2005). Quagents: A Game Platform for Intelligent Agents. *Proceedings of the First Artificial Intelligence and Digital Entertainment Conference*, Marina del Rey, CA, May 31 - June 2.
18. Brown, C.M., Barnum, P., Costello, D., Ferguson, G., Hu, B., and van Wie, M. (2004). *Quake II as a Robotic and Multi-Agent Platform*, Technical Report 853, University of Rochester Computer Science Department, October.
19. Blaylock, N., J. Allen, and G. Ferguson (2003). Managing communicative intentions with collaborative problem solving. Ronnie Smith and Jan van Kuppevelt, eds, *Current and New Directions in Discourse and Dialogue*. Kluwer, pp. 63-84.
20. Allen, J., and G. Ferguson (2002). Human-Machine Collaborative Planning. *Proceedings of the Third International NASA Workshop on Planning and Scheduling for Space*, Houston, TX, October 27-29.
21. Allen, J., N. Blaylock, and G. Ferguson (2002). A Problem Solving Model for Collaborative Agents. In *Proceedings of the Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-02)*, Bologna, Italy, July 31-August 2.

22. Blaylock, N., J. Allen, and G. Ferguson (2002). Synchronization in an Asynchronous Agent-based Architecture for Dialogue Systems. In *Proceedings of the Third SIGdial Workshop on Discourse and Dialogue*, Philadelphia, PA, July 11–12.
23. Ferguson, G., J. Allen, N. Blaylock, D. Byron, N. Chambers, M. Dzikovska, L. Galescu, X. Shen, R. Swier, and M. Swift (2002). *The Medication Advisor Project: Preliminary Report*. Technical Report 776, Dept. of Computer Science, University of Rochester.
24. Allen, J., D. Byron, M. Dzikovska, G. Ferguson, L. Galescu, and A. Stent (2001). Towards Conversational Human-Computer Interaction. *AI Magazine* 22(4), pp. 27–38.
25. Allen, J., G. Ferguson, and A. Stent (2001). An Architecture for More Realistic Conversational Systems. In *Proceedings of the Conference on Intelligent User Interfaces (IUI-01)*, Santa Fe, NM, January 14–17, pp. 1–8.
26. Allen, J., D. Byron, M. Dzikovska, G. Ferguson, L. Galescu, and A. Stent (2000). An Architecture for a Generic Dialogue Shell. In *Journal of Natural Language Engineering, special issue on Best Practices in Spoken Language Dialogue Systems Engineering*, 6(3), pp. 1–16.
27. Allen, J., G. Ferguson, B. W. Miller, E. K. Ringger, and T. Sikorski Zollo (2000). Dialogue Systems: From Theory to Practice in TRAINS-96. In Robert Dale, Hermann Moisl, and Harold Somers, eds., *Handbook of Natural Language Processing*, New York: Marcel Dekker, pp. 347–376.
28. Burstein, M., G. Ferguson, and J. Allen (2000). Integrating Agent-Based Mixed-Initiative Control With An Existing Multi-Agent Planning System. In *Proceedings of the International Conference on Multi-Agent Systems (ICMAS-00)*, Boston, MA.
29. Burstein, M., G. Ferguson, and J. Allen (2000). *Integrating Agent-Based Mixed-Initiative Control with an Existing Multi-Agent Planning System*. Technical Report 729, Computer Science Dept., University of Rochester.
30. Ferguson, G., and J. F. Allen (1998). TRIPS: An Integrated Intelligent Problem-Solving Assistant. In *Proceedings of the Fourteenth National Conference on Artificial Intelligence (AAAI-98)*, Madison, MI, 26–30 July, pp. 567–573.
31. Allen, J.F., and G. Ferguson (1997). Actions and Events in Interval Temporal Logic. In Oliviero Stock, ed., *Spatial and Temporal Reasoning*, Kluwer Academic Publishers, pp. 205–245.
32. Ferguson, G., J. F. Allen, B. W. Miller, and E. K. Ringger (1996). *The Design and Implementation of the TRAINS-96 System: A Prototype Mixed-Initiative Planning Assistant*. TRAINS Technical Note 96-5, Department of Computer Science, University of Rochester.
33. Traum, D., L. K. Schubert, M. Poesio, N. Martin, M. Light, C.-H. Hwang, P. Heeman, G. Ferguson, and J. F. Allen (1996). Knowledge Representation in the TRAINS-93 Conversation System. *International Journal of Expert Systems*, 9(1), pp. 173–223.
34. Ferguson, G., J. Allen, and B. Miller (1996). TRAINS-95: Towards a Mixed-Initiative Planning Assistant. In *Proceedings of the Third Conference on Artificial Intelligence Planning Systems (AIPS-96)*, Edinburgh, Scotland, 29–31 May, pp. 70–77.
35. Allen, J. F., G. Ferguson, and L. K. Schubert (1996). Planning in complex worlds via mixed-initiative interaction. In Austin Tate, ed., *Advanced Planning Technology: Technological Achievements of the ARPA/Rome Laboratory Planning Initiative*, AAAI Press, pp. 53–60.
36. Allen, J. F., L. K. Schubert, G. Ferguson, P. Heeman, C.-H. Hwang, T. Kato, M. Light, N. G. Martin, B. W. Miller, M. Poesio, and D. R. Traum (1995). The TRAINS Project: A Case Study in Defining a Conversational Planning Agent. *Journal of Experimental and Theoretical AI*, 7, pp. 7–48.

37. Allen, J. F., G. Ferguson, B. Miller, and E. Ringger (1995). TRAINS as an Embodied Natural Language Dialog System. In *Embodied Language and Action: Papers from the 1995 Fall Symposium*, AAAI Technical Report FS-95-05.
38. Ferguson, G. (1995). *Knowledge Representation and Reasoning for Mixed-Initiative Planning*. Ph.D. thesis, Department of Computer Science, University of Rochester. Available as Technical Report 562.
39. Allen, J. F., G. Ferguson, B. W. Miller, and E. K. Ringger (1995). Spoken Dialogue and Interactive Planning. In *Proceedings of the 1995 ARPA Spoken Language Systems Technology (SLST) Workshop*, Austin, Texas.
40. Allen, J. F., and G. Ferguson (1994). Actions and Events in Interval Temporal Logic. In *Journal of Logic and Computation, Special Issue on Actions and Processes*, 4(5), pp. 531–579.
41. Ferguson, G., and J. F. Allen (1994). Arguing About Plans: Plan Representation and Reasoning for Mixed-Initiative Planning. In *Proceedings of the Second International Conference on AI Planning Systems (AIPS-94)*, Chicago, IL, 13–15 June, pp. 43–48.
42. Poesio, M., G. Ferguson, P. Heeman, C. H. Hwang, D. R. Traum, J. F. Allen, N. G. Martin, and L. K. Schubert (1994). Knowledge Representation in the TRAINS System. In *Working Notes of the AAAI Fall Symposium on Knowledge Representation for Natural Language Processing in Implemented Systems*, New Orleans, LA.
43. Traum, D. R., J. F. Allen, G. Ferguson, P. A. Heeman, C. H. Hwang, T. Kato, N. Martin, M. Poesio, and L. K. Schubert (1994). Integrating Natural Language Understanding and Plan Reasoning in the TRAINS-93 Conversation System. In *Working Notes of the AAAI Spring Symposium on Active NLP*, Stanford, CA, 21–23 March, pp. 63–67.
44. Allen, J. F., and G. Ferguson (1993). Reasoning Deductively about Actions and Events. In S. Biundo and R. Waldinger, eds., *Proceedings of the International Dagstuhl Seminar on Deductive Approaches to Plan Generation and Plan Recognition*, 24–29 October. Available as German Research Center for Artificial Intelligence (DFKI) TR DD-93-17.
45. Ferguson, G., and J. F. Allen (1993). Generic Plan Recognition for Dialogue Systems. In *Proceedings of the ARPA Workshop on Human Language Technology*, Princeton, NJ, 21–23 March.
46. Ferguson, G., and J. F. Allen (1993). Cooperative Plan Reasoning for Dialogue Systems. In *Papers from the AAAI-93 Fall Symposium on Human-Computer Collaboration: Reconciling Theory, Synthesizing Practice*, Raleigh, NC, 22–24 October. Available as AAAI Technical Report FS-93-05.
47. Allen, J. F., and G. Ferguson (1993). Action in Interval Temporal Logic. In *Working Notes of the Second Symposium on Logical Formalizations of Commonsense Reasoning*, Austin, TX, 11–13 January, pp. 12–22.
48. Ferguson, G. (1992). *Explicit Representation of Events, Actions, and Plans for Assumption-Based Plan Reasoning*. Technical Report 428, Department of Computer Science, University of Rochester.
49. Ferguson, G. (1991). *Domain Plan Reasoning in TRAINS-90*. TRAINS Technical Note 91-2, Department of Computer Science, University of Rochester.
50. Ferguson, G. (1989). *Equality and Skolem Functions in Resolution-Based Hypothetical Reasoning*. M. Sc. thesis, Department of Computing Science, University of Alberta.

## Professional Service

Invited Judge, U.S. House of Representatives STEM App Challenge, NY 25<sup>th</sup> District, 2014-2016.

Senior Program Committee, AAAI-2014.

Reviewer, *Artificial Intelligence*, 2014.

Program Committee, AAAI-2013.

Program Committee, KCAP-2013.

Invited participant, CCC-NSF-NIH Symposium on Computing and Health: New Opportunities and Directions, October, 2012.

Reviewer, *Advances in Cognitive Systems (Journal)*, 2012.

Prize Committee Member, Deep Knowledge Representation Challenge (DKRC) 2012.

Invited speaker, Google CS4HS (Computer Science for High School) Workshop, Rochester Institute of Technology, July 2012.

Program Committee, UIST-2012.

Reviewer, *Journal of Autonomous Agents and Multi-Agent Systems*, 2012.

Program Committee, AAAI-2012.

Invited participant, Dagstuhl Seminar on Plan Recognition, April 2011.

Program Committee, AAAI-2011 (special track on “AI and the Web”).

Program Committee, KCAP-2011.

Program Committee, AAAI Spring Symposium on AI and Health Communication, 2011.

Reviewer, NSF SBIR (Division of Industrial Innovation & Partnerships), 2010.

Invited member, University of Rochester Health Sciences Center for Computational Innovation (HSCCI) Research Advisory Roundtable, 2009-2011.

Panelist, NSF SBIR, 2009.

Program Committee, IUI-2009.

Program Committee, KCAP-2009.

Organizer, “Daily Medicine: A panel exploring the changing paradigms of chronic illness,” MedTech-2008.

Reviewer, *Transactions on Systems, Man, and Cybernetics*, 2008.

Reviewer, *Intelligent User Interfaces (IUI)*, 2008.

Reviewer, *IEEE Transactions on Systems, Man, and Cybernetics*, 2008.

Panelist, NSF, 2008.

Reviewer, *Journal of Artificial Intelligence Research (JAIR)*, 2007.

Organizer, AAAI Spring Symposium on Intentions in Intelligent Systems, March 2007.

Program Committee, KCAP-2007.

Panelist, NSF, 2007.

Organizer, AAAI 2007 Spring Symposium on Intentions in Intelligent Systems, March 26-28, Stanford, CA.

Program Committee, AAAI-06.

Panelist, NSF, 2006.

Reviewer, *Journal of Web Semantics*, 2006.

Program Committee, ICAPS-05 Workshop on Preferences and Soft Constraints in Planning.

Invited participant, Robert Wood Johnson Synergy Workshop on Technology for Self-Care and Self-Monitoring, December 2005.

Program Committee, KCAP-05

Co-Organizer, ICAPS-2005 Workshop on Mixed-Initiative Planning and Scheduling  
Conference co-Chair, AAAI-2004.  
Program Committee, PRICAI-04  
Reviewer, Intl. Conference on the World Wide Web (WWW-2004).  
Invited speaker, AFRL/IISI Workshop on Mixed Initiative Decision Making, Cornell University, October 2003.  
Program Committee, International Conference on Knowledge Capture (K-CAP-03).  
Program Committee, Workshop on Mixed-Initiative Intelligence, IJCAI-03.  
Panelist/Reviewer, National Science Foundation, 2003.  
Reviewer, NASA, 2003.  
Program Committee, PRICAI-03.  
Chair, AAAI Intelligent Systems Demonstration Program, 1998-2002; IJCAI Intelligent Systems Demonstrations Program, 2003.  
Reviewer, *Artificial Intelligence*, 2002.  
Program Committee, Third International NASA Workshop on Planning and Scheduling for Space, October, 2002.  
Program Committee, AAAI-02 Workshop on Autonomy, Delegation, and Control: From Inter-Agent to Groups.  
Program Committee, Pacific Rim International Conference on Artificial Intelligence (PRICAI-02).  
Program Committee, Workshop on Autonomy, Delegation, and Control: Interacting with Autonomous Agents, IJCAI-01.  
Organizer, AAAI-99 Workshop on Mixed-Initiative Intelligence.  
Program Committee, IJCAI-99.  
Program Committee, European Conference on Planning (ECP-99).  
Organizer, AAAI-98 Workshop on Representations for Multi-modal Human-Computer Interaction.  
Organizer, AIPS-98 Workshop on Interactive and Collaborative Planning.  
Program Committee, National Conference on Artificial Intelligence (AAAI-97).  
Program Committee, International Joint Conference on Artificial Intelligence (IJCAI-97).  
Reviewer, *Journal of User Modelling and User-Adapted Interaction*, 1997.  
Reviewer, *Journal of Artificial Intelligence Research*, 1996.