

## Hannaneh Hajishirzi

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### Education

- **University of Illinois at Urbana-Champaign**  
MSc - Ph.D. in Computer Science (2003-present),  
Adviser: Eyal Amir.
- **Sharif University of Technology, Tehran, Iran**  
B.S. in Computer Engineering, Software (1998-2002),  
GPA: 3.78/4, Ranked 4<sup>th</sup>,  
Senior Thesis: Parallel Web Crawler of a Search Engine.

### Research Interests

Knowledge Representation, Probabilistic Reasoning, Natural Language Processing, Probabilistic Logical Models, Machine Learning, Commonsense Reasoning.

### Research Experience

- **Intern, IBM TJ Watson Research, Mentor: Erik T. Mueller, Manager: Doug Riecken, May 2007-Dec. 2007, May 2008-Aug 2008**
  - **Text Understanding through Probabilistic Reasoning about Actions (will be submitted to IJCAI-09)**  
In this project we present an approach to text understanding based on probabilistic reasoning about actions. Unlike most natural language processing systems, which merely perform syntactic analysis or extract facts, true text understanding systems build representations of the temporal sequence of world states and actions implied by a text. We use probabilities to represent ambiguities and uncertainties in text. We present an implemented path-based algorithm for answering questions about an input text.
- **Graduate Research Assistant, UIUC, Adviser: Eyal Amir, 2005-Present**
  - **Stochastic filtering in a probabilistic action model, (AAAI-07)** In this project we present a sampling-based algorithm to estimate the state of a dynamic system after time passes and given partial observations. Its expected error rate is significantly smaller than previous techniques given a fixed number of samples, as we prove and show empirically. The extension of this project (UAI-08) is filtering in first order logical domains and improving the efficiency and accuracy of the proposed algorithm.
  - **Monitoring change in web pages (will be submitted to IJCAI-09)**  
In many real-world situations we are charged with detecting changes as soon as possible. We model this problem in web pages with a POMDP and find the

optimal solution in several cases using a greedy algorithm. We executed some experiments in Wikipedia.

– **Tractable exact inference algorithms in DBNs.**

In this project we present a tractable inference algorithm for Dynamic Bayesian Networks (DBNs) with 1:1 transitions. Exact computation is intractable even for simple DBNs. We sidestep this problem by redefining state variables dynamically such that the posterior for time  $t$  is represented in a factored form.

• **Graduate Research Assistant, UIUC, Adviser: Dan Roth, 2007-present**

In this project we use machine learning and logical approaches to learn the rules of a card game (specifically solitaire) given the instructions.

• **Development of a story comprehension system**, (UIUC Course Project, Instructor: Dan Roth), Fall 2004.

• **TASK project** (OSL, UIUC Research Assistant, Adviser: Gul Agha) Poster Presentation to DARPA, Summer 2004.

We developed a physical agent simulation for describing and reasoning about systems consisting of several thousands to millions of agents.

”<http://osl.cs.uiuc.edu/research?action=topic&topic=TASK+project>”

• **Parallel “crawler” of a search engine**, (Technical Report, Sharif Univ., Adviser: Mohammad Ghodsi, 2002).

• **RoboCup soccer (small size)**, (Sharif Univ., Adviser: M. Manzuri, Summer 2001).

## Publications

- H. Hajishirzi, E. Amir, *Sampling first order logical particles* in UAI 2008, 2008.
- H. Hajishirzi and E. Amir, *Stochastic filtering in a probabilistic action model* in AAAI 2007, 2007.
- H. Hajishirzi and E. Amir, *Tractable exact inference algorithms in DBNs*, Technical Report, Computer Science Department, UIUC, 2005.

## Presentations

- IBM TJ Watson Research, Text Understanding through Probabilistic Reasoning about Actions, Aug 2008.
- Yahoo! Research, New York, Logical Particle Filtering and Text Understanding, May 2008.

## Work Experience

**IBM TJ Watson Research** Commonsense computing group, Text understanding project,

- Full-time intern, May 2008-Aug 2008.
- Part-time Intern, Aug 2007-Dec 2007.
- Full-time Intern, Summer 2007.

**ObjectJ Inc. , Software Developer**

- Developing LMS (Learning Management System), a web based project, which is a system for eLearning services using struts and EJB QL, Jan. 2003 - Jul 2003.

- Developing Sonata, a web based authoring tool, built on J2EE platform and taking advantage of web services, 2002.

## Teaching Experience

### Teaching Assistant, UIUC

- Programming Languages, Prof. Agha, Spring 2005.
- Numerical Methods, Prof. Kerkhoven, Fall 2004.
- Software Engineering I, II, Prof. Johnson, Fall 2003, Spring 2004.

## Professional Experience

- Refereeing conferences:
  - National Conference in Artificial Intelligence (AAAI) , 2007, 2008.
  - Uncertainty in Artificial Intelligence (UAI), 2007, 2008.
  - Logic for Programming, Artificial Intelligence, and Reasoning, 2007.
  - European Conference on Artificial Intelligence (ECAI), 2006.
- Co-organizing (AI-Vision-Robotics-HCI) AIVRH seminars, Fall 2006.

## Awards

- Ranked 3<sup>rd</sup> nation-wide in computer science MSc entrance exam, Iran, 2002
- Ranked 7<sup>th</sup> nation-wide MSc AI entrance exam, Iran, 2002
- Awarded Best all-women team and 2nd place in ACM contest, Asia Regional, Nov. 2001
- Ranked 2<sup>nd</sup> in ACM internal competition, Sharif University, 2001
- Ranked 58<sup>th</sup> among more than 1,250,000 participants in the national university entrance exam, 1998.
- Ranked 4<sup>th</sup> among all students of computer science, 1998-2002.

## Skills

- Programming Languages:  
C++, C#, Java, Matlab, Prolog, OCaml, Pascal.
- Web Development:  
JSP, J2EE, JavaScript, ASP.
- Database design, SQL.

## References

- Eyal Amir, Assistant Professor, UIUC, Urbana, IL  
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- Dan Roth, Professor, UIUC, Urbana, IL  
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- Erik T. Mueller, Research Staff Member, IBM TJ Watson Research, Hawthorne, NY  
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- Doug Riecken, Manager, IBM TJ Watson Research, Hawthorne, NY  
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