

# Matthew T. Hatem

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**Research Interests** Artificial intelligence, especially combinatorial search, hyperparameter optimization, machine learning and natural language processing.

**Education** UNIVERSITY OF NEW HAMPSHIRE Ph.D. in Computer Science, 2014  
Dissertation: *Heuristic Search with Limited Memory*  
Advisor: Wheeler Ruml.

**Professional Experience** GOOGLE 2017–present  
*Software Engineer*  
Responsible for personalization features of the Google Assistant. Helped launch improvements to semantic understanding in the Memory Aid feature. I am currently teaching the Assistant how to understand personal date references like birthdays and anniversaries.

MICROSOFT RESEARCH 2015–2017  
*Research Software Development Engineer*  
Responsible for hyperparameter optimization and automatic feature evaluation for large scale distributed deep neural networks with applications to natural language understanding. Led the design and development of a framework for conducting hyperparameter optimization experiments used every day by a team of 12 researchers and engineers.

INTERNATIONAL BUSINESS MACHINES 2011–2015  
*Senior Software Engineer: Watson Core Technology*  
Responsible for the design and analysis of algorithms necessary for adapting the Watson DeepQA pipeline to new domains. Developed feature extraction and scoring algorithms for open domain question answering eg., abbreviation expansion and passage similarity scoring with string-kernels. Lead a small team of highly skilled contributors to develop a state-of-the-art spell correction and case recovery system to improve performance for many Watson applications.

*Visiting Research Software Engineer: Watson DeepQA* April–June 2013  
Worked with Alfio Gliozzo on distributional semantic components and integration with the Watson DeepQA pipeline. Ported the JoBimText framework to the UIMA-AS platform and contributed enhancements and modifications back to the JoBimText open source project.

*Senior Software Engineer: Workplace, Portal and Collaboration (WPLC)* 2002–2011  
Technical lead for the WPLC Platform UI team. Responsible for design and implementation of UI components of the Eclipse-based rich client platform that was used by a suite of next-generation desktop applications including Lotus Symphony, Lotus Sametime and Lotus Notes.

*Eclipse Contributor and Committer* 2002–2009  
Responsible for contributions to the rich client platform features of Eclipse. Worked with other committers to enable features required by rich client applications including view life cycle enhancements, SWT widgets, themes and customization.

**Teaching Academic Experience** UNIVERSITY OF NEW HAMPSHIRE  
*Research Assistant*  
Researcher in parallel and external-memory heuristic search 2010-2014

UNIVERSITY OF NEW HAMPSHIRE

Graduate Teaching Assistant

Introduction to Artificial Intelligence (undergrad-grad)

Spring 2012

**Refereed  
Publications**

Matthew Hatem and Ethan Burns and Wheeler Ruml, "Solving Large Problems with Heuristic Search: General-Purpose Parallel External-Memory Search," *Journal of Artificial Intelligence Research* 62 233-268 2018.

Matthew Hatem and Scott Kiesel and Wheeler Ruml, "Recursive Best-First Search with Bounded Overhead," *Proceedings of the Twenty-ninth AAAI Conference on Artificial Intelligence (AAAI-15)* 2015.

Matthew Hatem and Wheeler Ruml, "Simpler Bounded Suboptimal Search," *Proceedings of the Twenty-eighth AAAI Conference on Artificial Intelligence (AAAI-14)* 2014.

Matthew Hatem and Wheeler Ruml, "Bounded Suboptimal Search in Linear Space: New Results," *Proceedings of the Seventh Annual Symposium on Combinatorial Search (SoCS-14)* 2014.

Matthew Hatem and Roni Stern and Wheeler Ruml, "Bounded Suboptimal Heuristic Search in Linear Space," *Proceedings of the Sixth Annual Symposium on Combinatorial Search (SoCS-13)* 2013.

Matthew Hatem and Wheeler Ruml, "External Memory Best-First Search for Multiple Sequence Alignment," *Proceedings of the Twenty-seventh AAAI Conference on Artificial Intelligence (AAAI-13)* 2013.

Chris Biemann, Bonaventura Coppola, Michael R. Glass, Alfio Gliozzo, Matthew Hatem and Martin Riedl, "JoBimText Visualizer: A Graph-based Approach to Contextualizing Distributional Similarity," *Proceedings of the EMNLP-13 Workshop on Graph-based Algorithms for Natural Language Processing (TextGraphs-8)* 2013.

Ethan Burns, Matthew Hatem, Michale J. Leighton and Wheeler Ruml, "Implementing Fast Heuristic Search Code," *Proceedings of the Fifth Annual Symposium on Combinatorial Search (SoCS-12)* 2012.

Matthew Hatem, Ethan Burns, and Wheeler Ruml, "Heuristic Search for Large Problems With Real Costs," *Proceedings of the Twenty-fifth AAAI Conference on Artificial Intelligence (AAAI-11)* 2011.

**Trade  
Publications**

Matthew Hatem and Ethan Burns and Wheeler Ruml, "Faster problem solving in Java with heuristic search," (available in English, Chinese, Russian, and Japanese), *IBM developerWorks* 2013.

**Awards**

IBM Outstanding Technical Achievement Award

2008

**Skills**

PROGRAMMING LANGUAGES AND APIS: PROFICIENT

Java, C/C++, Python, JavaScript, HTML, CSS, Eclipse SWT, Swing, L<sup>A</sup>T<sub>E</sub>X

PROGRAMMING LANGUAGES AND APIS: EXPERIENCED

OCaml, Golang, C#, TypeScript, Numpy, Matplotlib, TensorFlow

DEVELOPMENT ENVIRONMENTS AND TOOLS

Linux, OSX, Windows, Eclipse, Visual Studio, Anaconda, Emacs