

# Gregory Gelfond

## Curriculum Vitae

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### Current Position

**Research Scientist**, *Reasoning Group*, Noeon Research

### Areas of Specialization

Multi-Agent Systems, Programming Languages and Methodology, Knowledge Representation, Answer Set Programming

### Education

- May 2018 **PhD in Computer Science**, *Arizona State University*  
thesis *Representing and Reasoning about Dynamic Multi-Agent Domains: An Action Language Approach*  
chair Dr. Chitta Baral  
committee Dr. Subbarao Kambhampati, Dr. Joohyung Lee, Dr. Larry Moss, Dr. Tran Cao Son
- 2007 **MS in Computer Science**, *Texas Tech University*  
thesis *A Declarative Framework for Modeling Multi-Agent Systems*  
chair Dr. Richard Watson  
committee Dr. Daniel Cooke, Dr. Nelson Rushton, Dr. John Borelli
- 2003 **BS in Computer Science**, *Texas Tech University*

### Publications and Patents

- 2023 David Ferrucci, Nelson Rushton, Andrew Beck, Greg Burnham, David Nachman, Marcello Balduccini, Clifton McFate, and Gregory Gelfond. “Machine-Learning Assisted Natural Language Programming System”. Pat. 18114218.
- Gregory Gelfond, Marcello Balduccini, David Ferrucci, Aditya Kalyanpur, and Adam Lally. “Machines as Thought Partners: Reflections on 50 Years of Prolog”. In: *Prolog - The Next 50 Years*. Ed. by David S. Warren, Veronica Dahl, Thomas Eiter, Manuel Hermenegildo, Robert Kowalski, and Francesca Rossi. LNCS 13900. Springer.
- 2022 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “An Action Language for Multi-Agent Domains”. In: *Artificial Intelligence* 302, p. 103601. ISSN: 0004-3702.

- 2018 Gregory Gelfond. “Representing and Reasoning about Dynamic Multi-Agent Domains: An Action Language Approach”. PhD thesis. Arizona State University.
- 2015 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “An Action Language for Multi-Agent Domains: Foundations”. In: *CoRR* abs/1511.01960.
- Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Exploring the KD45n property of a Kripke model after the execution of an action sequence.” In: *In Proceedings of the Twenty-Ninth AAI Conference on Artificial Intelligence*. AAAI ’15.
- Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Multi-Agent Action Modeling through Action Sequences and Perspective Fluents.” In: *Proceedings of the AAAI Spring Symposium on Common Sense Reasoning 2015*. AAAI ’15.
- 2014 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Finitary S5-Theories”. In: *Logics in Artificial Intelligence*. Ed. by Eduardo Fermé and João Leite. Vol. 8761. Lecture Notes in Computer Science. Springer International Publishing, pp. 239–252.
- 2013 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Reasoning about the Beliefs of Agents in Multi-Agent Domains in the Presence of State Constraints: The Action Language mAL”. In: *Computational Logic in Multi-Agent Systems*. Ed. by João Leite, Tran Cao Son, Paolo Torroni, Leon Torre, and Stefan Woltran. Vol. 8143. Lecture Notes in Computer Science. Springer Berlin Heidelberg, pp. 290–306.
- 2012 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “An Action Language for Reasoning about Beliefs in Multi-Agent Domains”. In: *Proceedings of the 14th International Workshop on Non-Monotonic Reasoning*.
- Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Answer Set Programming and Planning with Knowledge and World-Altering Actions in Multiple Agent Domains”. In: *Correct Reasoning*. Ed. by Esra Erdem, Joohyung Lee, Yuliya Lierler, and David Pearce. Vol. 7265. Lecture Notes in Computer Science. Springer Berlin Heidelberg, pp. 509–526.
- 2011 Chitta Baral and Gregory Gelfond. “On Representing Actions in Multi-Agent Domains”. In: *Proceedings of the Symposium on Constructive Mathematics*. Ed. by Marcello Balduccini and Tran Cao Son. Springer, pp. 213–232.
- 2010 Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Logic Programming for Finding Models in the Logics of Knowledge and its Applications: A Case Study”. In: *Theory and Practice of Logic Programming* 10.4-6, pp. 675–690.
- Chitta Baral, Gregory Gelfond, Enrico Pontelli, and Tran Cao Son. “Using Answer Set Programming to Model Multi-Agent Scenarios Involving Agents’ Knowledge About Other’s Knowledge”. In: *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems*. AAMAS ’10, pp. 259–266.

2007 Gregory Gelfond. “A Declarative Framework for Modeling Multi-Agent Systems”. MA thesis. Texas Tech University.

Gregory Gelfond and Richard Watson. “Modeling Cooperative Multi-Agent Systems”. In: *Proceedings of the 4th International Workshop on Answer Set Programming*. ASP ’07.

2005 Chitta Baral, Gregory Gelfond, Michael Gelfond, and Richard Scherl. “Textual Inference by Combining Multiple Logic Programming Paradigms”. In: *AAAI’05 Workshop on Inference for Textual Question Answering*. AAAI ’05.

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## Academic & Professional Service

- 2018 Reviewer for the International Conference on Logic Programming (ICLP 2018)
- 2018 Reviewer for the Joint Conference on Artificial Intelligence (IJCAI 2018)
- 2015 Member of the Program Committee for the Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2015)
- 2014 Member of the Program Committee for the Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2014)
- 2013 Member of the Program Committee for the Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2013)
- 2012 Reviewer for the International Conference on Logic Programming (ICLP 2012)
- 2012 Reviewer for the Fourteenth International Symposium on the Practical Aspects of Declarative Languages (PADL 2012)
- 2011 Reviewer for the International Conference on Logic Programming (ICLP 2011)
- 2011 Reviewer for the International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2011)

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## Organizations & Affiliations

Texas Action Group, Association for Computing Machinery, Upsilon Pi Epsilon, Association for Logic Programming

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## Positions Held

- 2023–2024 **Research Software Engineer**, *Autonomous Systems Division*, University of Dayton Research Institute  
Member of the Autonomous Systems Division. Developed various models for autonomous flight systems and NLP support for conveying operator intent.

- 2021–2023 **Researcher**, *Knowledge Representation Group*, Elemental Cognition Inc.  
 Founding member of the Knowledge Representation Group. Co-inventor of the Cogent declarative programming language. Duties involved detailed design of the language’s syntactic and semantic primitives. Worked on the design of the compiler backend, in particular the compiler’s target into the native code of EC’s reasoning engine. One of the key designers of the overall methodology for the use of Cogent for knowledge representation and domain modeling tasks. Worked on the implementation of the compiler backend in a mixture of Java and an advanced derivative of the answer-set prolog declarative programming language.
- 2018–2021 **Research Fellow**, *Department of Computer Science*, The University of Nebraska, Omaha  
 Designed and taught a variety of courses, specializing in: Theory of Computation; Principles of Programming Languages (undergraduate and graduate level); and Data Structures. Helped design and institute an undergraduate concentration in artificial intelligence, and serve as an active member on the undergraduate curriculum committee.
- 2016–2018 **Visiting Assistant Professor**, *Department of Computer Science*, The University of Nebraska, Omaha  
 Taught a variety of courses including: Theory of Computation; Principles of Programming Languages (undergraduate and graduate level); Data Structures; Discrete Mathematics; Communication Networks and Introduction to Computer Science II.
- 2015–2016 **Instructor**, *Department of Computer Science and Software Engineering*, Miami University, Ohio  
 Taught courses on Object Oriented Programming as well Algorithm Design (to both graduate and undergraduate students).
- 2012–2015 **Lecturer**, *Department of Computer Science*, Texas Tech University, Lubbock  
 Designed and taught a variety of courses, specializing in: Principles of Programming I & II; Introduction to Artificial Intelligence; Systems Programming; and Operating Systems.
- 2009–2012 **Teaching/Research Assistant**, *School of Computing, Informatics, and Decision Systems Engineering*, Arizona State University, Tempe  
 Graded papers and helped teach courses such as: Principles of Programming with Java; Artificial Intelligence; and Natural Language Processing and Query Answering. Lectured subjects including: programming principles; knowledge representation; probabilistic reasoning; and declarative programming. Developed a pair of multi-agent action languages for representing and reasoning about the effects of actions in dynamic multi-agent domains. Extended theoretical frameworks for multi-agent reasoning by combining the work done within the reasoning about actions and dynamic epistemic logic communities. Worked on a grant in conjunction with SCIL/IARPA on natural language understanding with a focus on extracting information on social structures from both English and Russian text.
- 2007–2009 **Software Developer**, *Trust and Safety Group*, eBay Inc., Mountain View  
 Worked on a number of projects involving the integration of machine learning and advanced NLP techniques for fraud detection and prevention. Project generalist and troubleshooter, helping develop in-house tools for site activity analysis.