

# Dustin Dannenhauer

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## Current position

*Postdoctoral Research Associate* of the National Research Council at the Naval Research Laboratory

## Areas of specialization

Computer Science • Artificial Intelligence • Autonomous Systems  
Goal Reasoning • Automated Planning • Instance-based Learning  
Execution Monitoring • Metacognition • Cognitive Architectures

## Education

- 2012 - 2017 PH.D. in Computer Science, Lehigh University  
*Advisor:* Héctor Muñoz-Avila  
*Dissertation Title:* “*Self Monitoring Goal Driven Autonomy Agents*”
- 2008 - 2012 B.S. in Computer Science, Indiana University Bloomington  
*Departmental Honors*  
*Specializations:* Artificial Intelligence, Programming Language Theory

## Publications

REFEREED JOURNAL, CONFERENCE AND WORKSHOP PROCEEDINGS

- 2019 Muñoz-Avila, H., Dannenhauer, D., & Reifsnyder, N. Is Everything Going According to Plan? - Expectations in Goal Reasoning Agents. To appear in: *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*. Palo Alto, CA: AAAI Press.
- 2018 Dannenhauer, D., Cox, M. T., & Muñoz-Avila, H. Declarative Metacognitive Expectations for High-Level Cognition. *Advances in Cognitive Systems*. 2018.
- 2018 Boggs, J., Dannenhauer, D., Floyd, M. W., & Aha, D. W. The Ideal Rebellion: Maximizing Task Performance in Rebel Agents. *6th Goal Reasoning Workshop*. Stockholm, Sweden. IJCAI. 2018.

- 2018 Dannenhauer, D., Floyd, M. W., Molineaux, M., & Aha, D. W. Learning from Exploration: Towards an Explainable Goal Reasoning Agent. *Adaptive Learning Agents Workshop*. Stockholm, Sweden. IJCAI. 2018.
- 2018 Dannenhauer, D., Floyd, M. W., Magazzeni, D., & Aha, D. W. Explaining Rebel Behavior in Goal Reasoning Agents. *Workshop on Explainable AI Planning*. Delft, The Netherlands. ICAPS. 2018.
- 2018 Molineaux, M., Floyd, M. W., Dannenhauer, D., & Aha, D. W. Human-Agent Teaming as a Common Problem for Goal Reasoning. *Symposium on Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy*. AAAI Spring Symposium Series 2018. Stanford University, CA. 2018. <http://siddharthsrivastava.net/sirle18/>
- 2018 Molineaux, M., Dannenhauer, D., & Aha, D. W. Towards Explainable NPCs: A Relational Exploration Learning Agent. *Knowledge Extraction from Games Workshop*. New Orleans, LA. AAAI. 2018. <https://sites.google.com/view/kegworkshop/>
- 2017 Cox, M. T., Dannenhauer, D., & Kondrakunta, S. Goal Operations for Cognitive Systems. *Proceedings of the 31st AAAI Conference on Artificial Intelligence*. Palo Alto, CA: AAAI Press.
- 2016 Dannenhauer, D., Muñoz-Avila, H., & Cox, M. T. Informed Expectations to Guide GDA Agents in Partially Observable Environments. *Proceedings of the 25th International Joint Conference on Artificial Intelligence (IJCAI)*. Palo Alto, CA: AAAI Press. 2016.
- 2016 Cox, M. T., & Dannenhauer, D. Goal transformation and goal reasoning. M.Roberts (Ed.), *Working Notes of the 4th Workshop on Goal Reasoning*. New York, IJCAI. 2016. <http://makro.ink/ijcai2016grw/>
- 2016 Dannenhauer, D. Self Monitoring Goal Driven Autonomy Agents. *Doctoral Consortium, International Joint Conference on Artificial Intelligence (IJCAI)*. AAAI Press, 2016.
- 2016 Cox, M. T., Alavi, Z., Dannenhauer, D., Eyorokon, V., & Muñoz-Avila, H. MIDCA: A Metacognitive, Integrated Dual-Cycle Architecture for Self-regulated Autonomy. *Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI)*. Palo Alto, CA: AAAI Press. 2016.
- 2015 Dannenhauer, D., & Muñoz-Avila, H. Raising expectations in GDA agents acting in dynamic environments. *Proceedings of the 24th International Conference on Artificial Intelligence (IJCAI)*. AAAI Press, 2015.
- 2015 Dannenhauer, D., & Muñoz-Avila, H. Goal-Driven Autonomy with Semantically-annotated Hierarchical Cases. *International Conference on Case-Based Reasoning (ICCBR)*. Springer International Publishing, 2015. 88-103.
- 2015 Muñoz-Avila, H., Dannenhauer, D., & Cox, M. T. Towards cognition-level goal reasoning for playing real-time strategy games. *Goal Reasoning: Papers from the ACS Workshop*. 2015.
- 2014 Dannenhauer, D., Cox, M. T., Gupta, S., Paisner, M. & Perlis, D. Toward meta-level control of autonomous agents. In *Proceedings of the 2014 Annual International Conference on Biologically Inspired Cognitive Architectures: Fifth annual meeting of the BICA Society (BICA)*. Elsevier/Procedia Computer Science, 41, 226-232. 2014.
- 2013 Dannenhauer, D. Ontological Knowledge for Goal-Driven Autonomy Agents in Starcraft. *Doctoral Consortium, 9th Artificial Intelligence and Interactive Digital Entertainment Conference (AIIDE)*. 2013.

2013 Dannenhauer, D. & Muñoz-Avila, H. LUIGi: A Goal-Driven Autonomy Agent Reasoning with Ontologies. *Advances in Cognitive Systems Conference (ACS)*. 2013.

2013 Dannenhauer, D., Muñoz-Avila, H. Case-based Goal Selection Inspired by IBM's Watson. *International Conference on Case-Based Reasoning (ICCBR)*. Springer. 29-43. 2013.

#### MAGAZINE ARTICLES AND BLURBS

2017 Dannenhauer, D. "Planning and Scheduling." *AI Topics*. Apr. 2017. <https://aitopics.org/class/Technology/IT/AI/Representation%20&%20Reasoning/Planning%20&%20Scheduling> Web.

#### DOCTORAL DISSERTATION

2017 Dannenhauer, D. Self monitoring goal driven autonomy agents. *Doctoral dissertation*, Lehigh University, Department of Computer Science and Engineering, Bethlehem, PA.

## Teaching

#### TEACHING ASSISTANT AT LEHIGH UNIVERSITY

Fall 2014 CSE 318: Intro To Theory Of Computation

Fall 2014 CSE 340: Design and Analysis of Algorithms

#### UNDERGRADUATE INSTRUCTOR AT INDIANA UNIVERSITY BLOOMINGTON

Spring 2012 CSCI-C211: Introduction to Computer Science

Fall 2011 CSCI-B351: Introduction to Artificial Intelligence

Spring 2011 CSCI-C211: Introduction to Computer Science

Fall 2010 CSCI-C311: Introduction to Programming Languages

Spring 2010 CSCI-C211: Introduction to Computer Science

Fall 2009 CSCI-C211: Introduction to Computer Science

## Invited Talks

Oct. 2018 George Mason University, Fairfax, VA

Sept. 2018 Villanova University, Villanova, PA

Mar. 2017 Wright State Research Institute, Beavercreek, OH

Feb. 2017 Sonoma State University, Rohnert Park, CA

## Honors & Awards

2018 Selected as a DARPA Riser for early career scientists, presented at DARPA's 60th Anniversary Symposium, National Harbor, MD

2017 National Research Council (NRC) Postdoctoral Research Award

2014 - 2017 Rossin Doctoral Fellow

2012 - 2013 Lehigh University Fellowship

2011 - 2012 Ronald E. McNair Postbaccalaureate Achievement Program Recipient

2010 Undergraduate Instructor of the Year Award  
*Department of Computer Science, Indiana University*  
*Awarded solely based on student nominations*

## Service

2018 Program Committee Reviewer for the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-2019)  
2018 Co-organizer of the 6th Goal Reasoning Workshop at the International Joint Conference on Artificial Intelligence (IJCAI-2018)  
2018 Reviewer for the 6th Goal Reasoning Workshop at the International Joint Conference on Artificial Intelligence (IJCAI-2018)  
2018 Publicity Chair for the International Conference on Case-based Reasoning (ICCBR-2018)  
2018 Program Committee Reviewer for International Conference on Case-based Reasoning (ICCBR-2018)  
2018 Reviewer for Knowledge Extraction from Games Workshop (AAAI-2018)  
2018 Organized and chaired the Second Annual MIDCA Workshop at Wright State University  
2017 Program Committee Reviewer for the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-2018)  
2017 Program Committee Reviewer for 5th Goal Reasoning Workshop at the International Joint Conference on Artificial Intelligence (IJCAI-2017)  
2017 Reviewer for the Fifth Annual Conference on Cognitive Systems at Rensselaer Polytechnic Institute, Troy, New York  
2017 Organized and chaired the First Annual MIDCA Workshop at Wright State University  
2014 Vice President of the Graduate Student Senate at Lehigh University  
2013 Organized and facilitated a student panel as part of the 2nd Workshop on Goal Reasoning at the Conference on Advances in Cognitive Systems (ACS)

## Employment

2017-Pres Postdoctoral Research Associate of the National Research Council  
*Naval Research Laboratory, Washington, D.C.*  
Investigating areas of robust autonomous agents, explainable artificial intelligence, and rebel agents. Mentored two PhD students during summer of 2018 on the topics of rebel agents and online learning of action models.

2014 RESEARCH INTERNSHIP  
*University of Maryland, College Park, MD*  
Investigated metacognitive capabilities in autonomous agents under Michael T. Cox; Gained experience with TREX, Baxter robot, ROS, Gazebo, and the MIDCA cognitive Architecture

2012 RESEARCH INTERNSHIP  
*Naval Research Laboratory, Washington, D.C.*  
Explored literature on goal-reasoning agents under David Aha

2010 SOFTWARE ENGINEER INTERNSHIP  
*Cerner Corporation, Kansas City, MO*  
Assisted testing of a multi-threaded system to detect and fix race conditions; worked on a colorized text editor for healthcare formatted document editing.

## Certifications

Fall 2014 Teacher Development Program, Level One  
*Lehigh University*

## Conferences & Workshops Attended

2018 D60: DARPA's 60th Anniversary Symposium, National Harbor, MD  
*Selected as a DARPA Riser where I presented a poster on Goal Transformation to current DARPA Program Managers*

2018 Advances in Cognitive Systems (ACS-18), Stanford, California  
*Oral presentation in main conference*

2018 International Joint Conference on Artificial Intelligence (IJCAI-18), Stockholm, Sweden  
*Co-organizer of 6th Goal Reasoning Workshop*  
*Multiple oral presentations in 6th Goal Reasoning Workshop*  
*Poster in Adaptive Learning Agents (ALA) Workshop*  
*Organized joint panel between Goal Reasoning and Engineering Multi-Agent Systems (EMAS) Workshops*

2018 International Conference on Automated Planning and Scheduling (ICAPS-18), Delft, The Netherlands  
*Oral presentation in Explainable AI Planning Workshop*

2018 Association for the Advancement of Artificial Intelligence (AAAI-18), New Orleans, LA  
*Oral Presentation in Knowledge Extraction from Games Workshop*

2018 Second Annual MIDCA Workshop, Wright State University  
*Organizer, Chair of the workshop*  
*Multiple oral presentations*

2017 International Joint Conference on Artificial Intelligence (IJCAI-17), Melbourne, Australia  
*Oral presentation in Goal Reasoning Workshop*

2017 First Annual MIDCA Workshop, Wright State University  
*Organizer, Chair of the workshop*  
*Multiple oral presentations*

2016 International Joint Conference on Artificial Intelligence (IJCAI-16), New York City, NY  
*Oral presentation in main conference*  
*Oral presentation in doctoral consortium*  
*Oral presentation in Goal Reasoning Workshop*

2016 Association for the Advancement of Artificial Intelligence (AAAI-16), Phoenix, AZ

- 2015      International Joint Conference on Artificial Intelligence (IJCAI-15), Buenos Aires, Argentina  
*Oral presentation in main conference*
- 2015      Advances in Cognitive Systems (ACS-15), Atlanta, GA  
*Oral presentation in Goal Reasoning Workshop*
- 2013      Advances in Cognitive Systems (ACS-13) , Baltimore, MD  
*Chair and participant of the student panel*  
*Poster in main conference*
- 2013      Artificial Intelligence and Interactive Digital Entertainment (AIIDE), Boston, MA  
*Poster in doctoral consortium*
- 2013      International Conference on Case-based Reasoning (ICCBR), Saratoga Springs, NY  
*Oral presentation in main conference*  
*Oral presentation in doctoral consortium*
- 2011      Association for the Advancement of Artificial Intelligence (AAAI), San Francisco
- 2011      Machine Learning Summer School, Purdue University, June 13th - 24th