

# RONALD W. ALFORD

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## PROFILE

I am a researcher at MITRE investigating semi-autonomous operation for unmanned vehicles and the foundations of automated planning with procedural knowledge.

## EDUCATION

2014    PhD. in Computer Science —  
University of Maryland, College Park  
Thesis: “Search Complexities for HTN Planning.” Advisor: Dana Nau

2005    Bachelor of Science in Mathematics —  
University of Maryland, College Park

2002    Bachelor of Science in Computer Science —  
University of Maryland, College Park

## RESEARCH APPOINTMENTS

2016–Present    Senior Autonomous Systems Engineer —  
The MITRE Corporation, McLean, VA

2014–2016        Postdoctoral Research Fellow —  
Adaptive System, U.S. Naval Research Laboratory, Washington, DC

2002–2007        Faculty Research Assistant —  
Department of Computer Science, University of Maryland, College Park

## JOURNAL ARTICLES

- [1] Ron Alford, Ugur Kuter, Dana Nau, and Robert P. Goldman. Plan aggregation for strong cyclic planning in nondeterministic domains. In: *Artificial Intelligence* 216 (2014), pp. 206–232.
- [2] ZD Myers et al. Cosmic ray 1h and 2h spectra from BESS 98. In: *Advances in Space Research* 35.1 (2005), pp. 151–155.

CONFERENCE PUBLICATIONS

- [3] Vikas Shivashankar, Ron Alford, Mark Roberts, and David W. Aha. Cost-optimal algorithms for planning with procedural control knowledge. In: *Proceedings of the 22<sup>nd</sup> European Conference on Artificial Intelligence (ECAI)*. IEEE. 2016.
- [4] Ron Alford, Vikas Shivashankar, Mark Roberts, Jeremy Frank, and David W. Aha. Hierarchical planning: relating task and goal decomposition with task sharing. In: *Proceedings of the 25<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. AAAI Press. 2016, pp. 3022–3029.
- [5] Mark Roberts, Vikas Shivashankar, Ron Alford, Michael Leece, Shubham Gupta, and David W. Aha. Goal reasoning, planning, and acting with ActorSim, the actor simulator. In: *Proceedings of the 4<sup>th</sup> Annual Conference on Advances in Cognitive Systems*. Cognitive Systems Foundation. 2016.
- [6] Ron Alford, Gregor Behnke, Daniel Höller, Pascal Bercher, Susanne Biundo, and David W. Aha. Bound to plan: exploiting classical heuristics via automatic translations of tail-recursive HTN problems. In: *Proceedings of the 26<sup>th</sup> International Conference on Automated Planning and Scheduling (ICAPS)*. AAAI Press. 2016, pp. 20–28.
- [7] Hayley Borck, Justin Karneeb, Michael W. Floyd, Ron Alford, and David W. Aha. Case-based policy and goal recognition. In: *Proceedings of the 23<sup>rd</sup> International Conference on Case-Based Reasoning (ICCBR)*. Springer. 2015, pp. 30–43.
- [8] Ron Alford, Pascal Bercher, and David W. Aha. Tight bounds for HTN planning with task insertion. In: *Proceedings of the 24<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. AAAI Press. 2015, pp. 1502–1508.
- [9] Ron Alford, Pascal Bercher, and David W. Aha. Tight bounds for HTN planning. In: *Proceedings of the 25<sup>th</sup> International Conference on Automated Planning and Scheduling (ICAPS)*. AAAI Press. 2015, pp. 7–15.
- [10] Ron Alford, Hayley Borck, Justin Karneeb, and David W. Aha. Active behavior recognition in beyond visual range air combat. In: *Proceedings of the 3<sup>rd</sup> Annual Conference on Advances in Cognitive Systems (ACS)*. Cognitive Systems Foundation. Atlanta, GA, USA, 2015.
- [11] Hayley Borck, Justin Karneeb, Ron Alford, and David W. Aha. Case-based behavior recognition in beyond visual range air combat. In: *Proceedings of the 28<sup>th</sup> International Florida Artificial Intelligence Research Society Conference (FLAIRS)*. AAAI Press. 2015, pp. 379–384.

- [12] Ron Alford, Vikas Shivashankar, Ugur Kuter, and Dana S. Nau. On the feasibility of planning graph style heuristics for HTN planning. In: *Proceedings of the 24<sup>th</sup> International Conference on Automated Planning and Scheduling (ICAPS)*. AAAI Press, 2014, pp. 2–10.
- [13] Vikas Shivashankar, Ron Alford, Ugur Kuter, and Dana Nau. The GoDeL planning system: a more perfect union of domain-independent and hierarchical planning. In: *Proceedings of the 23<sup>rd</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. AAAI Press, 2013, pp. 2380–2386.
- [14] Ron Alford, Vikas Shivashankar, Ugur Kuter, and Dana S Nau. HTN problem spaces: structure, algorithms, termination. In: *Proceedings of the 5<sup>th</sup> Annual Symposium on Combinatorial Search (SoCS)*. AAAI Press, 2012, pp. 2–9.
- [15] Vikas Shivashankar, Ugur Kuter, Dana Nau, and Ron Alford. A hierarchical goal-based formalism and algorithm for single-agent planning. In: *Proceedings of the 11<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. Vol. 2. International Foundation for Autonomous Agents and Multiagent Systems, 2012, pp. 981–988.
- [16] Ron Alford, Ugur Kuter, and Dana S Nau. Translating HTNs to PDDL: a small amount of domain knowledge can go a long way. In: *Proceedings of the 21<sup>st</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. AAAI Press, 2009, pp. 1629–1634.
- [17] Ron Alford, Ugur Kuter, Dana Nau, Elnatan Reisner, and Robert Goldman. Maintaining focus: overcoming attention deficit disorder in contingent planning. In: *Proceedings of the 22<sup>nd</sup> International Florida Artificial Intelligence Research Society Conference (FLAIRS)*. AAAI Press, 2009, pp. 177–182.
- [18] O Ganel et al. Cosmic ray energetics and mass (CREAM): calibrating a cosmic ray calorimeter. In: *Proceedings of the 10<sup>th</sup> International Conference on Calorimetry in High Energy Physics*. 2002, pp. 133–138.
- [19] O Ganel et al. Cosmic ray energetics and mass: configuration and progress on construction and testing. In: *Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference*. Vol. 6. 2001, p. 2163.
- [20] JZ Wang et al. Space based calorimeters: heavy ion simulations. In: *Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference*. Vol. 4. 2001, p. 1445.
- [21] JZ Wang et al. Isotopic measurements of cosmic-ray hydrogen and helium during the 1997 solar minimum. In: *Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference*. Vol. 5. 2001, p. 1671.

REFEREED WORKSHOP PAPERS AND ABSTRACTS

- [22] Vikas Shivashankar, Ron Alford, Mark Roberts, and David W. Aha. Cost-optimal algorithms for hierarchical goal network planning: a preliminary report. In: *ICAPS Workshop on Heuristics and Search for Domain-Independent Planning (HSDIP)*. 2016, pp. 102–110.
- [23] Mark Roberts, Ron Alford, Vikas Shivashankar, Michael Leece, Shubham Gupta, and David W. Aha. ACTORSIM: a toolkit for studying goal reasoning, planning, and acting. In: *ICAPS Workshop on Planning and Robotics (PlanRob)*. 2016, pp. 184–194.
- [24] Ronald Alford. Search complexities for HTN planning. In: *Künstliche Intelligenz (KI)* 30.1 (2015). Thesis abstract, pp. 99–100.
- [25] Ron Alford, Pascal Bercher, and David W. Aha. Tight bounds for HTN planning with task insertion. In: *Proceedings of the 8<sup>th</sup> Annual Symposium on Combinatorial Search (SoCS)*. Extended abstract. AAAI Press. 2015, pp. 221–222.
- [26] Mark Roberts, Swaroop Vattam, Ronald Alford, Bryan Auslander, Tom Apker, Benjamin Johnson, and David W. Aha. Goal reasoning to coordinate robotic teams for disaster relief. In: *Proceedings of the 3<sup>rd</sup> Workshop on Planning and Robotics (PlanRob)*. 2015.
- [27] Hayley Borck, Justin Karneeb, Ron Alford, and David W. Aha. Case-based behavior recognition to facilitate planning in unmanned air vehicles. In: *Case-based Agents: Papers from the ICCBR Workshop*. University College Cork: Cork, Ireland, 2014.
- [28] Mark Roberts, Swaroop Vattam, Ronald Alford, Bryan Auslander, Justin Karneeb, Matthew Molineaux, Tom Apker, James McMahan, and David W. Aha. Iterative goal refinement for robotics. In: *Planning and Robotics: Papers from the ICAPS Workshop*. 2014.
- [29] Vikas Shivashankar, Ron Alford, Ugur Kuter, and Dana S. Nau. Hierarchical goal networks and goal-driven autonomy: going where AI planning meets goal reasoning. In: *Goal Reasoning: Papers from the ACS Workshop*. 2013, pp. 95–110.

TECHNICAL REPORTS

- [30] Caitlin A. Whitter, Ronald Alford, David W. Aha, and Justin Karneeb. Programming a human interaction access point for a virtual air combat simulation environment. Tech. rep. AIC-015-188. Washington, DC: U.S. Naval Research Laboratory, Navy Center for Applied Research on Artificial Intelligence, 2015.

TALKS

- Progress on planning with procedural knowledge. The MITRE Corporation, McClean, VA. Dec. 2015.
- Progress on planning with procedural knowledge. NASA Ames, Mountain View, CA. Oct. 2015.
- Progress on planning with procedural knowledge. Ulm University, Ulm, Germany. June 2015.
- Automated planning in the context of intelligent agents. U.S. Naval Research Laboratory, Washington, DC. July 2014.
- Current directions in HTN planning. U.S. Naval Research Laboratory, Washington, DC. May 2014.
- Goal reasoning: interactions with planning. Goal Reasoning Summit at the U.S. Naval Research Laboratory, Washington, DC. Apr. 2014.
- MINDSWAP - Maryland information and network dynamics lab semantic web agents project. With Daniel Krech in the Workshop on Semantic Interoperability at the Open University, Milton Keynes, UK. Feb. 2005.

TEACHING

- 2015 Summer intern mentor, U.S. Naval Research Laboratory, Washington, DC  
Led two undergraduates and one high school student on summer projects
- 2011 Teaching assistant, University of Maryland, College Park.  
Graduate course on automated planning
- 2010 Guest instructor at Poolesville High School, Maryland.  
Designed and led curriculum for introductory topics on computer networking and game theory

SERVICE

- 2016 Publicity co-chair and program committee for the 27<sup>th</sup> International Conference on Automated Planning and Scheduling (ICAPS)
- 2016 Grant panelist for NASA
- 2016 Program Committee for the 25<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)
- 2016 Program Committee for the 4<sup>th</sup> Workshop on Goal Reasoning at IJCAI-2016
- 2016 Reviewer for the Annals of Mathematics and Artificial Intelligence

- 2015 Organizing Committee for the 7<sup>th</sup> Workshop on Heuristics and Search for Domain Independent Planning (HSDIP)
- 2015 Organizing Committee for Workshop on Goal Reasoning at the 3<sup>rd</sup> Annual Conference on Advances in Cognitive Systems
- 2015 Grant panelist for the National Science Foundation
- 2015 Reviewer for the Annals of Mathematics and Artificial Intelligence
- 2014 Judge for NRL's SEAP summer student presentations
- 2014 Doctoral Consortium mentor at ICAPS
- 2013 Organized the PhD. Presentation Group for PhD. candidates at the University of Maryland

#### NON-ACADEMIC EMPLOYMENT

- 2002–2014 Linux Consultant — SC&A
- 2007–2009 Summer, Winter Intern — Clark-Parsia
- 2001–2007 Network Engineer — CruiseEmail

#### COMPUTER SKILLS

- Languages* Java, Haskell, Python, C, Javascript, C++
- Standards* XML, RDF, OWL, HTML, CSS, PDDL