Philip **Dasler**

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Education

PhD, Computer Science — *College Park, Maryland USA*

University of Maryland — *May 2020*

- **Focus:** Computational Geometry, Automated Traffic Management
- **Dissertation:** *Efficient Algorithms for Coordinated Motion in Shared Spaces*
- **Advisor:** David M. Mount

MS, Computer Science — *Houston, Texas USA*

University of Houston — *Dec 2011*

- **Focus:** Computational Intelligence and Game Theory
- **Thesis:** *Playing Challenging Iterated Two-Person Games Well*
- **Advisor:** Predrag Tošić

BS, Computer Science — *Austin, Texas USA*

University of Texas — *Dec 2005*

Journal Publications

Philip Dasler and David M. Mount. "Modular Circulation and Applications to Traffic Management," **invited submission** to the journal *Algorithmica*, 2019.

Conference Publications

Philip Dasler, Sana Malik, and Matt Mauriello. "'Just follow the lights': Low-Cost Embedded Indicators for Navigation in Built Environments," *ACM Symposium on User Interface Software and Technology (UIST)*, 2020 (in review).

Philip Dasler and David M. Mount. "Online Algorithms for Warehouse Management," *30th International Symposium on Algorithms and Computation (ISAAC)*, 2019.

Philip Dasler and David M. Mount. "Modular Circulation and Applications to Traffic Management," *Algorithms and Data Structures Symposium (WADS)*, 2017.

Ahmed Abdelkader, Aditya Acharya, and **Philip Dasler**. "2048 Without New Tiles is Still Hard," *8th International Conference on Fun with Algorithms (FUN)*, 2016.

Philip Dasler and David M. Mount. "On the Complexity of an Unregulated Traffic Crossing," *Algorithms and Data Structures Symposium (WADS)*, 2015.

Ahmed Abdelkader, Aditya Acharya, and **Philip Dasler**. "2048 is NP-Complete," *Young Researchers Forum at the Symposium on Computational Geometry (SoCG)*, 2015.

Predrag Tošić and **Philip Dasler**. "On Finding and Learning Effective Strategies for Complex Non-Zero-Sum Repeated Games," *IEEE/WIC/ACM Intelligent Agent Technology (IAT)*, 2012.

Predrag Tošić and **Philip Dasler**. "Traveler's Dilemma," *Proceedings of the International Conference on Agents and Artificial Intelligence (ICAART)*, 2012.

Predrag Tošić and **Philip Dasler**. "Iterated Traveler's Dilemma: Analysis of Individual and Team Performances and Challenges Ahead," *Proceedings of the Ninth European Workshop on Multi-Agent Systems (EUMAS)*, 2011.

Philip Dasler and Predrag Tošić. "Playing Challenging Iterated Two-Person Games Well: A Case Study on Iterated Traveler's Dilemma," *Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP)*, 2011.

Predrag Tošić and **Philip Dasler**. "How To Play Well in Non-Zero Sum Games: Some Lessons from the Generalized Traveler's Dilemma," *Proceedings of the International Conference on Active Media Technology (AMT)*, 2011.

Philip Dasler and Predrag Tošić. "Playing Challenging Iterated Two-Person Games Well: A Case Study on the Iterated Traveler's Dilemma," *Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP)*, 2011.

Philip Dasler and Predrag Tošić. "The Iterated Traveler's Dilemma: Finding Good Strategies in Games with 'Bad' Structure," *Proceedings of the Eighth European Workshop on Multi-Agent Systems (EUMAS)*, 2010.

Research Experience

Efficient Algorithms for Coordinated Motion in Shared Spaces
University of Maryland, College Park

PhD Dissertation - Motion Planning — *Sep 2015 - May 2020*

- Performed a formal analysis of problems involving the coordinated motion of multiple agents in constrained, shared spaces (such as urban traffic networks with self-driving cars or autonomous warehouse management systems), including the definition of formal models, proofs of computational complexity, and development of approximation algorithms.
- Devised a novel variant of classic circulation problems (called ”circulation with modular demands”) as a technique for solving problems of steady-state traffic flow across urban transportation networks.
- Developed self-organizing online algorithms for minimizing retrieval time in an automated warehouse with shifting product popularity.

IoT Ecosystem for Human Navigation in Indoor Spaces
Adobe Inc.

Data Science Research Intern — *Jun 2019 - Sep 2019*

- Designed and created a prototype IoT ecosystem for deploying low-cost human navigational systems in built environments.
- Designed all ecosystem elements, including the rapid prototyping of a mesh network of ESP8266-based LED indicators, a central framework for integrating and controlling mixed-fidelity devices, and a mechanism for rapid ingestion and preparation of map data.
- Conducted a formative survey of prior navigational challenges, as well as a controlled mixed-methods evaluation of the deployed prototype in an active office environment.

Natural Language Processing/Machine Translation
University of Maryland, College Park

Graduate Research Assistant, Computational Linguistics and Information Processing Lab — *May 2012 - May 2013*

- Devised and tested a new method for natural language translation verification and iterative improvement via the identification of reliability anchors by comparison of back-translations with the original source text.

Empirical Analysis of Strategies for the Iterated Traveler’s Dilemma
University of Houston

MS Thesis - Computational Intelligence — *Sep 2015 - May 2020*

- Performed a round-robin comparative analysis of 38 different strategies for the Iterated Traveler’s Dilemma, a non-zero-sum game that defies classical game theoretic notions.
- Defined and coded a tournament including simplistic, greedy, and reactive strategies, as well as agents based on opponent modeling, reinforcement learning, and negotiation strategy.

Industry Experience

Locurio, Inc.
Seattle, WA, USA

Co-Founder/Technology Lead — *Aug 2015 - Present*

- Co-founded a multi-award-winning immersive experiences company, well-known for its highly-rated escape rooms, interactive storytelling, and engaging puzzles.
- Designed, prototyped, and fabricated original puzzles and adventure experiences based on the seamless integration of IoT devices within the built environment.
- Developed strategies for expansion and diversification of the business, including monetization of complementary experiences.

University of Maryland Institute for Advanced Computer Studies
College Park, MD, USA

Research Programmer — *Oct 2011 - Jan 2012*

- Supported the Foresight and Understanding from Scientific Exposition (FUSE) Program funded by the Intelligence Advanced Research Projects Activity (IARPA) by creating tools in Python for the detection of emerging technical concepts within a large corpus of published scientific, technical, and patent literature. These tools include a naïve Bayes classifier, a custom UIMA-Python interface, and a series of feature extraction and metric gathering programs.

United Space Alliance
Houston, TX, USA

Computer Science Staff II — *May 2007 - Apr 2011*

- Developed, supported, and troubleshot C++ math models within a real-time simulation architecture for the simulation of complex avionics, mechanical systems, space craft dynamics and kinematics, and natural environment effects for the NASA-JSC CEV Avionics Integration Laboratory.
- Gathered and documented requirements for simulation software through the analysis of technical space systems documentation and stakeholder meetings.

Multimedia Games (now Everi Games)
Austin, TX, USA

Mod Programmer — *Jul 2006 - Feb 2007*

- Modified library of existing video slot-machine games to comply with various regional laws and requirements. Includes debugging game logic, framework, and hardware, as well as modifying finite state machine based logic.

Lockheed Martin *Houston, TX, USA*

Honors Graduate Intern *Summers, 2000 - 2005*

- Supported research efforts of the Dexterous Robotics Lab's Robonaut project, including the study of force feedback controllers and the efficacy of human/robot teams performing space construction tasks.
- Designed and populated on-board robot power distribution PCBs.
- Operated the Dexterous Anthropomorphic Robotic Testbed (DART) telepresence system during lab demonstrations.
- Reduced real-time synchronization errors of mission critical backup servers.
- Updated dynamics/kinematics modeling software for spacecraft docking simulations, including translation of legacy C++ code into Java.

Invited Talks

May 2017	***Puzzle Writing Lessons From the Trenches***, Up The Game: Escape Room Conference	*Breda, Netherlands*
Feb 2014	***The Famine Game: Post-mortem***, GC Summit: Google Campus	*Mountain View, CA, USA*

Conference Talks

Apr 2020	***Efficient Algorithms for Coordinated Motion in Shared Spaces***, University of Maryland	*College Park, MD, USA*
Dec 2019	***Online Algorithms for Warehouse Management***, ISAAC 2019	*Shanghai, China*
Aug 2017	***Modular Circulation and Applications to Traffic Management***, WADS 2017	*St. John's, NL, Canada*
Oct 2015	***On the Complexity of Motion Planning with Traffic***, University of Maryland	*College Park, MD, USA*
Aug 2015	***On the Complexity of an Unregulated Traffic Crossing***, WADS 2015	*Victoria, BC, Canada*
Oct 2014	***On the Complexity of an Unregulated Traffic Crossing***, FWCG 2014	*Storrs, CT, USA*
Aug 2011	***Playing Challenging Iterated Two-Person Games Well***, University of Houston	*Houston, TX, USA*
May 2011	***The Iterated Traveler's Dilemma: Seeking Stability in An Unstable Action Space***, SIAM DS11	*Snowbird, UT, USA*

Teaching

CMSC 754	**Computational Geometry (Graduate)**, Teaching Assistant	*University of Maryland*
CMSC 422	**Machine Learning (Undergraduate)**, Teaching Assistant	*University of Maryland*
CMSC 132	**Object Oriented Programming II - Java (Undergraduate)**, Teaching Assistant	*University of Maryland*
CMSC 131	**Object Oriented Programming I - Java (Undergraduate)**, Teaching Assistant	*University of Maryland*

Honors & Awards

2017	**Best Paper**, WADS 2017, recognized in special issue of the journal *Algorithmica*
2008	**Quest for Excellence Technical Achievement Award**, United Space Alliance
2001 - 2005	**Jack Seriff Presidential Endowed Scholarship**, University of Texas
2000 - 2004	**Lockheed Martin Honors Graduate Internship**, Lockheed Martin Space Operations
2003	**Elite Team Award**, NASA-JSC Automation, Robotics, and Simulation Division

Service

2018	**Submission Reviewer**, Internation Workshop on Combinatorial Algorithms (IWOCA)
2018	**Submission Reviewer**, Symposium on Computational Geometry (SoCG)
2015	**Submission Reviewer**, International Colloquium on Automata, Languages, and Programming (ICALP)
2013, 2014	**Graduate Student Representative**, Computer Science Department Education Council
2000	**Competition Judge**, South Texas Regional FIRST Lego League Robotics

Skills

Programming	Python, Java, C++, MQTT
Tools	Git, Unity, Fusion 360, Sketchup
Prototyping	Arduino, Node MCU, ESP 8266, Raspberry Pi, 3D Printing
Languages	English, French (A2), German (A1)