Dr. Philip M. Dames

Assistant Professor
Department of Mechanical Engineering
Temple University

Contact Information

1947 North 12th Street
Room 608A
Philadelphia, PA 19122 USA

Phone: +1–215–204–7974
E-mail: pdames@temple.edu
URL: https://sites.temple.edu/pdames/

Employment

Temple University, Philadelphia, PA

Assistant Professor, Mechanical Engineering — July 2016 – Present

University of Pennsylvania, Philadelphia, PA

Adjunct Assistant Professor — Sept. 2016 – Present
Mechanical Engineering and Applied Mechanics

Postdoctoral Researcher, Electrical and Systems Engineering — July 2015 – June 2016

- Supervisors: Professor Vijay Kumar and Professor George J. Pappas

Education

University of Pennsylvania, Philadelphia, PA

Ph.D., Mechanical Engineering and Applied Mechanics — Sept. 2010 – June 2015

- Advisor: Professor Vijay Kumar
- Dissertation: Multi-Robot Active Information Gathering Using Random Finite Sets

Northwestern University, Evanston, IL

Bachelor of Science, *Summa cum Laude*, Mechanical Engineering — June 2010

Master of Science, Mechanical Engineering — June 2010

- Advisor: Professor Kevin Lynch

Awards

IEEE CASE Best Application Paper Finalist — 2015

University of Pennsylvania Center for Teaching & Learning Teaching Certificate — 2015

National Defense Science & Engineering Graduate Fellowship — 2011 – 2014

Northwestern University Mechanical Engineering Academic Achievement Award — 2010

National Science Foundation Graduate Research Fellowship Honorable Mention — 2010

Unpublished Papers

[U1] **Philip Dames**. Distributed Multi-Target Search and Tracking using the PHD Filter. *1st International Symposium on Multi-Robot and Multi-Agent Systems.* **Under review.**

Refereed Journal Publications

[J7] Henry Carrillo, **Philip Dames**, Vijay Kumar, and José Castellanos. A Utility Function for Graph SLAM based Autonomous Robotic Exploration Rooted in Rényi's General Theory of Entropy. *Autonomous Robots, Special Issue on Active Perception.*
doi:10.1007/s10514-017-9662-9

[J6] **Philip Dames**, Pratap Tokekar, and Vijay Kumar. Detecting, Localizing, and Tracking an Unknown Number of Moving Targets Using a Team of Mobile Robots. *International Journal of Robotics Research*. doi:10.1177/0278364917709507

[J5] Jonas Cleveland, Dinesh Thakur, **Philip Dames**, Cody Philips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. An Automated System for Semantic Object Labeling with Soft Object Recognition and Dynamic Programming Segmentation. *IEEE Transactions on Automation Science and Engineering* 14.2 (2017): 820–833. doi:10.1109/TASE.2016.2631085

[J4] **Philip Dames**, Mac Schwager, Daniela Rus, and Vijay Kumar. Active Magnetic Anomaly Detection Using Multiple Micro Aerial Vehicles. *IEEE Robotics and Automation Letters* 1.1 (2016): 153–160. doi:10.1109/LRA.2015.2511444

[J3] **Philip Dames** and Vijay Kumar. Autonomous Localization of an Unknown Number of Targets without Data Association Using Teams of Mobile Sensors. *IEEE Transactions on Automation Science and Engineering* 12.3 (2015): 850–864. doi:10.1109/TASE.2015.2425212

[J2] **Philip Dames**, Dinesh Thakur, Mac Schwager, and Vijay Kumar. Playing Fetch with Your Robot: The Ability of Robots to Locate and Interact with Objects. *IEEE Robotics and Automation Magazine* 21.2 (2014): 46–52. doi:10.1109/MRA.2013.2295947

[J1] Thomas H. Vose, Matthew H. Turpin, **Philip M. Dames**, Paul Umbanhowar, and Kevin M. Lynch. Modeling, Design, and Control of 6-DoF Flexure-Based Parallel Mechanisms for Vibratory Manipulation. *Mechanism and Machine Theory* 64 (2013): 111–130. doi:10.1016/j.mechmachtheory.2012.12.007

Refereed Conference Publications

[C8] Marcus Pan, Amanda Prorok, **Philip Dames**, Mark Oehlberg, and Edward Lee. Integration of Robotic Systems into an IoT Framework via Accessors. *Proceedings of the Eleventh Biennial Ptolemy Miniconference*, Berkeley, CA, USA, October 2015. [Acceptance rate unknown]

[C7] **Philip Dames**, Pratap Tokekar, and Vijay Kumar. Detecting, Localizing, and Tracking an Unknown Number of Moving Targets Using a Team of Mobile Robots. *Proceedings of the 2015 International Symposium on Robotics Research* (ISRR), Sestri Levante, Italy, September 2015. [Acceptance rate unknown]

[C6] **Philip Dames** and Vijay Kumar. Automated Detection, Localization, and Registration of Smart Devices With Multiple Robots. *Proceedings of the 2015 IEEE International Conference on Automation Science and Engineering* (CASE), Gothenburg, Sweden, August 2015. doi:10.1109/CoASE.2015.7294139 [Acceptance rate: 62%]

[C5] Jonas Cleveland, Dinesh Thakur, **Philip Dames**, Cody Philips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. An Automated System for Semantic Object Labeling with Soft Object Recognition and Dynamic Programming Segmentation. *Proceedings of the 2015 IEEE International Conference on Automation Science and Engineering* (CASE), Gothenburg, Sweden, August 2015.
Best Application Paper Finalist.
doi:10.1109/CoASE.2015.7294159 [Acceptance rate: 62%]

[C4] Henry Carrillo, **Philip Dames**, Vijay Kumar, and José Castellanos. Autonomous Robotic Exploration Using Occupancy Grid Maps and Graph SLAM Based on Shannon and Rényi Entropy. *Proceedings of the 2015 IEEE International Conference on Robotics and Automation* (ICRA), Seattle, WA, USA, May 2015. doi:10.1109/ICRA.2015.7139224 [Acceptance rate: 41%]

[C3] **Philip Dames** and Vijay Kumar. Cooperative Multi-Target Localization with Noisy Sensors. *Proceedings of the 2013 IEEE International Conference on Robotics and Automation* (ICRA), Karlsruhe, Germany, May 2013. doi:10.1109/ICRA.2013.6630825 [Acceptance rate: 39%]

[C2] **Philip Dames**, Mac Schwager, Vijay Kumar, and Daniela Rus. A Decentralized Control Policy for Adaptive Information Gathering in Hazardous Environments. *Proceedings of the 2012 IEEE Conference on Decision and Control* (CDC), Maui, HI, USA, December 2012. doi:10.1109/CDC.2012.6426239 [Acceptance rate: 53.4%]

[C1] Mac Schwager, **Philip Dames**, Daniela Rus, and Vijay Kumar. A Multi-Robot Control Policy for Information Gathering in the Presence of Unknown Hazards. *Proceedings of the 15th International Symposium on Robotics Research* (ISRR), Flagstaff, AZ, USA, August 2011. doi:10.1007/978-3-319-29363-9_26 [Acceptance rate unknown]

Patents

[P2] Jonas Cleveland, Dinesh Thakur, **Philip Dames**, Cody Philips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. "United States Patent – Autonomous Vehicle for Mapping Store Layout." Submitted May 2016.

[P1] Jonas Cleveland, Dinesh Thakur, **Philip Dames**, Cody Philips, Terry Kientz, Kostas Daniilidis, John Bergstrom, and Vijay Kumar. "United States Patent – Automatic Mapping of Store Layout Using Soft Object Recognition." Submitted May 2016.

Other Publications

[O4] **Philip Dames**. Multi-Robot Active Information Gathering Using Random Finite Sets. Ph.D. dissertation, University of Pennsylvania, Philadelphia, PA, 2015.

[O3] **Philip Dames** and Vijay Kumar. Experimental Characterization of a Bearing-only Sensor for Use With the PHD Filter. arXiv: 1502.04661 [cs.RO], 2015.

[O2] **Philip Dames** and Vijay Kumar. Technical Report: Cooperative Multi-Target Localization with Noisy Sensors. arXiv: 1302.3857 [cs.RO], 2013.

[O1] **Philip Dames**, Mac Schwager, Vijay Kumar, and Daniela Rus. A Decentralized Control Policy for Adaptive Information Gathering in Hazardous Environments. University of Pennsylvania, 2012.

Invited Presentations

[Pr10] "Multi-Robot Active Information Gathering Using Random Finite Sets." Department of Mechanical Engineering. Temple University, Philadelphia, Pennsylvania, March 8, 2016.

[Pr9] "Multi-Robot Active Information Gathering Using Random Finite Sets." Department of Aeronautics and Astronautics. Stanford University, Stanford, California, October 13, 2015.

[Pr8] Keynote Address. Annual Technology Management Conference at Saab Dynamics. "Quadrotor Swarms: Hardware, Algorithms, and Applications." Co-presenter with Sarah Tang. Karlskoga, Sweden, February 4, 2015 and Linköping, Sweden, February 5, 2015.

[Pr7] Workshop on the Future of Multiple-Robot Research and its Multiple Identities. "Localizing Large Numbers of Targets Without Data Association Using Teams of Mobile Robots." IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Chicago, IL, USA, September 18, 2014.

[Pr6] Workshop on MATLAB/Simulink for Robotics Education and Research. "Teaching Forward and Inverse Kinematics of Robotic Manipulators Via MATLAB." IEEE International Conference on Robotics and Automation (ICRA), Hong Kong, June 5, 2014.

[Pr5] Workshop on Opportunities and Challenges of Joint Inference and Control in Mobile Robotics. "Information-based Multi-target Localization Using Small Teams of Mobile Sensors." IEEE International Conference on Robotics and Automation (ICRA), Hong Kong, May 31, 2014.

[Pr4] Workshop on Networked Multi-Agent Systems: From Theory to Practice. "Decentralized Multi-Robot Exploration With Intermittent Access to the Cloud." IEEE International Conference on Robotics and Automation (ICRA), Karlsruhe, Germany, May 6, 2013.

[Pr3] Workshop on Stochastic Motion Planning and Information-based Control. "Multi-target Localization Using Mutual Information and the CPHD Filter." Robotics: Science and Systems (RSS), Sydney, Australia, July 11, 2012.

[Pr2] Data-to-Decisions and Autonomy Workshop. Defence Science Institute, Melbourne, Australia, July 9, 2012.

[Pr1] Workshop on Stochastic Geometry in SLAM. "Adaptive Information Gathering Using Visual Sensors." IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA, May 18, 2012.

Student Advising

Graduate

- Jun Chen, Ph.D. candidate — Aug. 2017 – Present
- Meng Wu, Ph.D. candidate — Aug. 2017 – Present
- Karl Fetzer, Ph.D. candidate (Villanova University) — July 2017 – Present

Undergraduate

- Ajmain Hossain — Jan. 2017 – Present
- George Kevrekidis, Quinn Wu, and James Raubenheimer — Summer 2016
- Marcus Pan, TerraSwarm REU — Summer 2015
- Megan Tienjaroonkul, GRASP Laboratory NSF REU Program — Summer 2013

Funding

Current

[1] Pennsylvania Department of Health

Minimally Invasive Bioinspired Surgical Needle for Diagnostic and Treatment of Brain Injury

Role: Co-PI — PI: Parsaoran Hutapea (Temple)

Other Co-PIs: Kurosh Darvish, Fei Ren, Haijun Liu (Temple)

Funding: $100,000 — Dates: July 1, 2017 – June 30, 2018

Teaching Experience

Instructor — **Temple University**

MEE 4411/5411: Introduction to Mobile Robotics — Fall Semester 2017

MEE 2011: Linear Systems — Fall Semester 2016

Instructor **University of Pennsylvania**

MEAM 620: Advanced Robotics Spring Semester 2016

- Co-instructor with Professor Kostas Daniilidis.

Teaching Assistant **University of Pennsylvania**

MEAM 520: Introduction to Robotics Fall Semester 2012

MEAM 248: Sophomore Design Laboratory II Spring Semester 2012

MEAM 210: Statics and Strength of Materials Fall Semester 2011

Teaching Assistant **Northwestern University**

DSGN 245-1: Computer Aided Design 1 (60 students) Winter Quarter 2010

DSGN 245-2: Computer Aided Design 2 (40 students) Spring Quarter 2010

Professional Memberships

IEEE Institute for Electrical and Electronic Engineers
IEEE Robotics and Automation Society

ASEE Association for Engineering Education

Professional Service

Guest Editor, IEEE Transactions on Robotics, Special Issue on Aerial Swarm Robotics
Feb. 2017 – Present

Review Editor, Multi-Robot Systems, Frontiers in Robotics and AI 2014 – Present

Referee Service – Journals

- Autonomous Robots (AURO)
- EURASIP Journal on Advances in Signal Processing
- IEEE Intelligent Systems (IS)
- IEEE Robotics and Automation Letters (RAL)
- IEEE Robotics and Automation Magazine (RAM)
- IEEE Transactions on Automation Science and Engineering (T-ASE)
- IEEE Transactions on Robotics (T-RO)
- IEEE Transactions on Signal Processing (T-SP)
- The International Journal of Robotics Research (IJRR)

Referee Service – Conferences

- Distributed Autonomous Robotic Systems (DARS)
- IEEE International Conference Automation Science and Engineering (CASE)
- IEEE/RSJ International Conference Intelligent Robots and Systems (IROS)
- IEEE International Conference on Robotics and Automation (ICRA)
- International Federation of Automatic Control (IFAC)
- International Symposium on Robotics Research (ISRR)
- International Symposium on Multi-Robot and Multi-Agent Systems (MRS)
- Robotics: Science and Systems (RSS)

IEEE Robotics and Automation Society Conference Activities Board

- Assisted in the development, distribution, and analysis of a survey on conference formats after the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Chicago, IL, September 14–18, 2014.
  Results available at: http://iros2014.org/general-information/survey-results

Outreach

MESA Pennsylvania July 2017 – Present

- Helping to develop a robotics/IoT challenge for the statewide competition

FIRST® LEGO® League
- Volunteer referee for middle school robotics competition Spring 2012, 2014, 2015
- Volunteer practice room coordinator Spring 2013

Proposal for a Blended Learning Program as part of a National Science Foundation Science and Technology Center Fall 2014 – Spring 2015
- Assisted in the development of low-cost, robot-based curriculum to teach STEM concepts to middle school and high school students

Citizenship United States of America.

References Available upon request.

Last updated August 15, 2017