

Yoonchang Sung

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EDUCATION

Virginia Tech, Blacksburg, USA *September 2014 - Expected in 2019*
Ph.D. in Electrical & Computer Engineering
Advisor: Pratap Tokekar

Korea University, Seoul, Korea *August 2013*
M.S. in Mechanical Engineering
Advisor: Woojin Chung

Korea University, Seoul, Korea *February 2011*
B.S. in Mechanical Engineering

EMPLOYMENT

Postdoctoral Researcher *September 2019 -*
Computer Science and Artificial Intelligence Laboratory, MIT, Cambridge, USA
Hosts: Leslie Kaelbling & Tomás Lozano-Pérez

Research Assistant *September 2016 - Present*
Dept. of Electrical & Computer Engineering, Virginia Tech, Blacksburg, USA
Advisor: Pratap Tokekar

Research Assistant *September 2014 - August 2016*
Dept. of Mechanical Engineering, Virginia Tech, Blacksburg, USA
Advisor: Brian Lattimer

Research Intern *August 2013 - June 2014*
Center for Bionics, Korea Institute of Science and Technology, Seoul, Korea
Supervisor: JongSuk Choi

Research Assistant *March 2011 - August 2013*
Dept. of Mechanical Engineering, Korea University, Seoul, Korea
Advisor: Woojin Chung

TEACHING

Guest Lecturer
Dept. of Electrical & Computer Engineering, Virginia Tech, Blacksburg, USA
ECE 4984: SS:Robot Motion Planning, Introduction to ROS *August 2018*

Teaching Assistant
Dept. of Mechanical Engineering, Korea University, Seoul, Korea
MECH 210: Computer Aided Mechanical Drawing *Spring 2012*
MECH 328: Machine Component Design *Fall 2011*

PUBLICATIONS

Journal Articles

In Preparation

[J6] **Y. Sung**, J. Das, and P. Tokekar, An introduction to decision-theoretic tools for robotic environmental monitoring, *IEEE Robotics and Automation Magazine (RAM)*, Note: In Preparation.

Under Review

[J5] **Y. Sung**, D. Dixit, and P. Tokekar, Online multi-robot exploration of a translating plume: competitive algorithm and experiments, *IEEE Transactions on Robotics (T-RO)*, Note: Under Review.

[J4] **Y. Sung**, and P. Tokekar, GM-PHD filter for searching and tracking an unknown number of targets with a mobile sensor with limited FoV, *IEEE Transactions on Automation Science and Engineering (T-ASE)*, Note: Revision Under Review.

Published

[J3] **Y. Sung**, AK Budhiraja, RK Williams, and P. Tokekar, Distributed assignment with limited communication for multi-robot multi-target tracking, *Autonomous Robots (AURO), Special Issue on Robot Communication Challenges*, pp. 1-17, 2019.

[J2] C. Knabe, R. Griffin, J. Burton, G. Cantor-Cooke, L. Dantanarayana, G. Day, O. Ebeling-Koning, E. Hahn, M. Hopkins, J. Neal, J. Newton, C. Nogales, V. Orekhov, J. Peterson, M. Rouleau, J. Semintore, **Y. Sung**, J. Webb, N. Wittenstein, J. Ziglar, A. Leonessa, B. Lattimer, and T. Furukawa, Team VALORs ESCHER: A novel electromechanical biped for the DARPA Robotics Challenge, *Journal of Field Robotics (JFR)*, 34(5): pp. 912-939, 2017.

[J1] **Y. Sung**, and W. Chung, Hierarchical sample-based joint probabilistic data association filter for following human legs using a mobile robot in a cluttered environment, *IEEE Transactions on Human-Machine Systems (T-HMS)*, 46(3): pp. 340-349, 2016.

Refereed Conference Publications

In Preparation

[C12] **Y. Sung**, and P. Tokekar, Robot routing algorithms for translational TSP with neighborhoods, Note: In Preparation.

Under Review

[C11] **Y. Sung**, D. Dixit, and P. Tokekar, GP-UCB in 3D exploration, *IEEE International Conference on Robotics and Automation (ICRA)*, 2020, Note: Under Review.

Published

[C10] **Y. Sung**, and P. Tokekar, A competitive algorithm for online multi-robot exploration of a translating plume, *IEEE International Conference on Robotics and Automation (ICRA)*, 2019.

[C9] Z. Zhang, J. Lee, JM Smereka, **Y. Sung**, L. Zhou, and P. Tokekar, Tree search techniques for minimizing detectability and maximizing visibility, *IEEE International Conference on Robotics and Automation (ICRA)*, 2019.

[C8] **Y. Sung**, AK Budhiraja, RK Williams, and P. Tokekar, Distributed simultaneous action and target assignment for multi-robot multi-target tracking, *IEEE International Conference on Robotics and Automation (ICRA)*, 2018.

[C7] **Y. Sung**, and P. Tokekar, Hierarchical GM-PHD filter for false alarm reduction in search and tracking task, *US-KOREA Conference on Science, Technology and Entrepreneurship (UKC)*, 2017.

[C6] **Y. Sung**, and P. Tokekar, Algorithms for searching and tracking an unknown and varying number

of mobile targets using a limited FoV sensor, *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.

[C5] JH Kim, **Y. Sung**, and B. Lattimer, Bayesian estimation based real-time fire-heading in smoke-filled indoor environments using thermal imagery, *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.

[C4] **Y. Sung**, and T. Furukawa, Information measure for the optimal control of target searching via the grid-based method, *International Conference on Information Fusion (Fusion)*, 2016.

[C3] B. Lattimer, J. Starr, J. McNeil, C. Nogales, J. Peterson, J. Ziglar, J. Burton, C. Knabe, **Y. Sung**, J. Seminatore, R. Griffin, J. Newton, V. Orekhov, M. Rouleau, M. Hopkins, D. Hong, and D. Lee, Humanoid firefighting robot for structure fires, *International Conference and Exhibition on Fire Science and Engineering (Interflam)*, 2016.

[C2] D. Cha, H. Cho, J. Jin, H. Kwon, J. Kim, H. Lee, J. Seong, C. Moon, H. Kim, **Y. Sung**, and W. Chung, Tracking human legs for an indoor mobile robot with a single laser range finder, *International Conference on Engineering and Applied Sciences (ICEAS)*, 2015.

[C1] **Y. Sung**, and W. Chung, Human tracking of a mobile robot with an onboard LRF(Laser Range Finder) using human walking motion analysis, *International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, 2011.

Refereed Workshop Publications

[W2] **Y. Sung**, S. Buebel, and P. Tokekar, Detecting and mapping hazardous plumes with aerial and surface robots, *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Robot Teammates Operating in Dynamic, Unstructured Environment*, 2018.

[W1] **Y. Sung**, AK Budhiraja, RK Williams, and P. Tokekar, Distributed simultaneous action and target assignment for multi-robot multi-target tracking, *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Multi-robot Perception-driven Control and Planning*, 2017.

Book Chapters

[B1] C. Knabe, R. Griffin, J. Burton, G. Cantor-Cooke, L. Dantanarayana, G. Day, O. Ebeling-Koning, E. Hahn, M. Hopkins, J. Neal, J. Newton, C. Nogales, V. Orekhov, J. Peterson, M. Rouleau, J. Seminatore, **Y. Sung**, J. Webb, N. Wittenstein, J. Ziglar, A. Leonessa, B. Lattimer, and T. Furukawa, Team VALORs ESCHER: A Novel Electromechanical Biped for the DARPA Robotics Challenge, *The DARPA Robotics Challenge Finals: Humanoid Robots To The Rescue*. Springer, Cham., pp. 583-629, 2018.

Posters

[P1] **Y. Sung**, and W. Chung, Implementation of JPDAFs to track humans for a mobile robot with a laser range finder, *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, 2013.

Patents

Y. Sung, and W. Chung, Leg tracking method based on SJPDAF method, KR (No. 10-1573620)

SERVICE

Workshop Co-organizer

- Robotics: Science and Systems (RSS) Pioneers 2020, Oregon, USA June 2020

- Full-day workshop, Robotics: Science and Systems (RSS), Freiburg, Germany June 2019

Workshop Title: Robots in the wild: challenges in deploying robust autonomy for robotic exploration

(link to the workshop website)

Reviewer

- *Journals*: IEEE Transactions on Robotics (T-RO), IEEE Transactions on Automation Science and Engineering (T-ASE)
- *Conferences*: IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE International Conference on Robotics and Automation (ICRA), Workshop on the Algorithmic Foundations of Robotics (WAFR), International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

INVITED TALKS

Robust Autonomy in the Wild

- NAVER LABS, Seoul, Korea *July 2019*
- Dept. of Aerospace Engineering, Korea Advanced Institute of Science and Technology *June 2019*

HONORS

Awards

- RAS Travel Grants: ICRA *2017-2019*
- Robotics: Science and Systems (RSS) Pioneers *2019*
- DARPA Robotics Challenge (DRC) Finalist *2015*

Graduate Fellowship

- Research Assistant Scholarships, Virginia Tech, Blacksburg, USA *Fall 2014–Present*
- The Welfare Section Scholarship, Korea University, Seoul, Korea *Spring 2012, Fall 2012*
- Research Assistant Scholarships, Korea University, Seoul, Korea *Fall 2011*
- The Second Stage of BK21 Scholarship, Korea University, Seoul, Korea *Spring 2011*

Undergraduate Fellowship

- Best Honors Scholarships, Korea University, Seoul, Korea *Spring 2010*
- Honors Scholarships, Korea University, Seoul, Korea *Fall 2008, Spring 2009, Fall 2010*
- National Science Scholarship, Korea University, Seoul, Korea *Fall 2009*

References Available Upon Request

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