Kuya Takami Ph.D.

Postdoctoral Research Fellow
Department of Mechanical Engineering
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Updated: April 15, 2016
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RESEARCH INTERESTS
Robot Audition, Human-Robot Interaction, Mobile Robot, Bayesian Robotics

EDUCATION

Virginia Tech, Blacksburg, VA
Ph.D. Mechanical Engineering, 2015
Dissertation: *Non-Field-of-View Acoustic Target Estimation*
Advisor: Professor Tomonari Furukawa

University of Wisconsin-Madison, Madison, WI
M.S. Mechanical Engineering, 2011
Advisor: Professor Scott Sanders

University of Wisconsin-Madison, Madison, WI
B.S. Biomedical Engineering (Biomecanics), 2008

APPOINTSMENTS

10/2015 - Present **Virginia Polytecnic Institute and State University**Blacksburg, VA
Postdoctoral Research Fellow Computational Multiphysics and Systems Lab
Professor Tomonari Furuakawa

- Primary researcher on National Science Foundation EAGER project, non-line-of-sight (NLOS) target localization in an unknown environment.
  - Developed probabilistic approach to NLOS visual/ acoustical target estimation based on recursive Bayesian estimation framework, and conducting test on human/ mobile sensor platform for human-robot-interaction.
  - Collaboration with Daniel Kish, president of World Access for the Blind, for perception of acoustic diffraction and reflection signal processing for human echolocation experts.
  - Grant proposal writing for National Robotics Initiative (NRI) NSF16-517 with Dr. Furukawa.
- Leader of Mohamed Bin Zayed International Robotics Challenge 2017 team for the Challenges. The project consists of perception, navigation, and manipulation based on actual mobile robots to operate the valve with tools.
- Developing an autonomous car and associative technologies including new sensors for a project sponsored by General Motors and Murata Manufacturing. Advising one MS student for the NSF EAGER project and mentoring a senior design project, Self-Driving Vehicle Team, consisting of nine senior students.

08/2011 - 09/2015 VT **Graduate Research Assistant/ *Graduate Teaching Assistant**

- Developed NLOS hybrid optical/acoustical target localization scheme to model and predict the state of sound source in a complex environment (2011-2015).
- Modeled sound reflection/diffraction based NLOS target estimation for mobile robot localization (2011-2015).
- Assisted underwater autonomous navigation project on sonar localization simulation using simultaneous localization and mapping (SLAM) funded by Office of Naval Research (2011-2012).
- Worked on real-time autonomous driving using Grid-based SLAM in collaboration with ZMP and University of Technology, Sydney (2012-2014).
- Worked on tire noise prediction model entailing mathematical formulations, and fluid-solid interaction modeling funded by NSF Center for Tire Research (2012-2015).
- *Project Advisor (ME4015/4016): Supervised senior design project on autonomous driving, and automotive alternator design and experimental validation (2011-2012).

05/2014 – 08/2014 **Bridgestone Americas, Inc** Akron, OH
Advanced Tire Technology - Research intern

- Developed tire noise analysis procedure and designed and implemented tire noise experimental device based on an FPGA controller.

01/2013 - 07/2013 **ZMP, Inc** Tokyo, Japan
Research Engineer in Autonomous Vehicles

- Assisted programming and hardware development for an autonomous driving vehicle, including data acquisition, implementation of SLAM, and vehicle modeling/control.
- Designed and constructed a quadrupedal machine learning-based evolving robot by calculating kinematics and specifying components.

03/2009 - 08/2011 **University of Wisconsin-Madison** Madison, WI (03/2009 - 08/2011)
Graduate Research Assistant for Engine Research Center

- Conducted laser and fiber optics centered research optimizing optical element design in harsh environments.
- Developed a noninvasive laser grid tomography temperature measurement system for jet and IC engines.

TECHNICAL STRENGTH

Computer Languages:	C/C++, Java	System:	Windows, Linux, OS X
Software:	ROS, MATLAB, Visual Studio	Languages:	English, Japanese (native)
CAD & FEA:	SolidWorks, PTC Creo, Abaqus		

AWARDS AND HONORS

2015 ASME:IDETC/CIE Best Student Paper Award
2014 Pratt Graduate Fellowship‡
2012 Pratt Graduate Fellowship‡
2011 Pratt Graduate Fellowship‡
2007 Most Outstanding Physics Award†

‡: Awarded to students who are aggressively recruited by other top engineering colleges
†: Scholarship to the best student in physics courses at University of Wisconsin-EC

EXTRACURRICULAR EXPERIENCE

2013 – 2015	Mechanical Engineering Graduate Student Council
2013 – 2015	Mechanical Engineering Graduate Ambassador
2011 – 2014	President of VT Slackline Club
2012 – 2015	President of Japanese Conversation Group
2005 – 2006	President of Japanese Cultural Society in University of Wisconsin-EC
2014 – 2015	Volunteer Graduate student mentor
	Society National Society of Leadership and Success, Biomedical Engineering Society

PUBLICATIONS

- **K. Takami**, T. Furukawa, M. Kumon, D. Kimoto, and G. Dissanayake. "Estimation of a nonvisible field-of-view mobile target incorporating optical and acoustic sensors," Autonomous Robots, 2015.
- **K. Takami**, T. Furukawa, M. Kumon, and G. Dissanayake. "Non-Field-of-View Acoustic Target Estimation in Complex Indoor Environment," Springer Tracts in Advanced Robotics, 2015.
- **K. Takami**, T. Furukawa, M. Kumon, and L. Mak,"Non-Field-of-View Indoor Sound Source Localization based on Reflection and Diffraction," Multi-sensor Integration and Fusion, IEEE, 2015.
- **K. Takami**, T. Furukawa, M. Kumon, and G. Dissanayake. "Non-Field-of-View Acoustic Target Estimation in Complex Indoor Environment," Field and Service Robotics, 2015.
- T. Furukawa, **K. Takami**, X. Tong, D. Watman, A. Hamed, R. Ranasinghe and G. Dissayanake, "Map-based Navigation of an Autonomous Car Using Grid-based Scan-to-Map Matching," ASME IDETC, 2015.
- **K. Takami** and T. Furukawa,"High-Resolution Deformation Measurement System for Fast Rotating Tire," ASME IDETC/CIE, 2015.
- **K. Takami** and T. Furukawa,"High-Resolution Deformation Measurement System for Fast Rotating Tires Towards Noise Prediction," Euronoise., 2015.
- M. Kumon, D. Kimoto, **K. Takami** and T. Furukawa, "Acoustic recursive Bayesian estimation for non-field-of-view targets," In Image Analysis for Multimedia Interactive Services (WIAMIS), IEEE, 2013.
- M. Kumon, D. Kimoto, **K. Takami** and T. Furukawa. "Bayesian non-field-of-view target estimation incorporating an acoustic sensor," In Intelligent Robots and Systems, IEEE/RSJ International Conference, 2013.
- **K. Takami**, S. Taheri, M. Taheri and T. Furukawa, "Prediction of Railroad Track Foundation Defects Using Wavelets," Joint Rail Conference, ASME, 2013.
- J. M. Whitney, **K. Takami**, S. T. Sanders, and Y. Okura. "Design of system for rugged, low-noise fiber-optic access to high-temperature, high-pressure environments," Sensors Journal, IEEE, 2011.
- A. Xinliang, T. Kraetschmer, **K. Takami**, S. T. Sanders, L. Ma, et al. "Validation of temperature imaging by H_2O absorption spectroscopy using hyperspectral tomography in controlled experiments," Journal of Applied Optics, 2011.