Kuya Takami, Ph.D.

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EDUCATION

Virginia Polytechnic Institute and State University 2015
Ph.D. Mechanical Engineering
Thesis: "Non-Field-of-View Acoustic Target Estimation" Advisor: Professor Tomonari Furukawa

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

University of Wisconsin-Madison *2008*
B.S. Biomedical Engineering (Biomechanics)

APPOINTMENTS

VIRGINIA POLYTECNIC INSTITUTE AND STATE UNIVERSITY Blacksburg, VA
Postdoctoral Research Fellow (10/2015 - Present)
Computational Multiphysics and Systems Lab with Professor Tomonari Furuakwa

- 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 mobile manipulator team for the Challenge 2. The project consists of perception, navigation, and manipulation based on actual mobile robots to operate the valve with tools.
- Developed and implemented an FPGA based high-resolution imaging system with the integration to tire testing machine at Toyo Rubber.
- 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.

Graduate Research Assistant/ *Graduate Teaching Assistant (08/2011 - 09/2015)

- 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).
- *Instructor (ME 2024-Engineering Design and Economics): Lectured mechanical engineering students on product development (Fall 2013).
- *Project Advisor (ME4015/4016): Supervised senior design project on autonomous driving, and automotive alternator design and experimental validation (2011-2012).

BRIDGESTONE AMERICAS, INC Akron, OH (05 - 08/2014)
Advanced Tire Technology - Research intern

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

ZMP, INC Tokyo, Japan (01 - 07/2013)
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.

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.

UNIVERSITY OF WISCONSIN HOSPITAL Madison, WI (08/2007 - 12/2008)
MRI Research Assistant for Radiology Department

- Studied MRI-based knee analysis, quantified quality of the image, and determined change of cartilage volumes.

HONORS AND AWARDS

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

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

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		

EXTRACURRICULAR EXPERIENCE

Organization	Mechanical Engineering Graduate Student Council (2013-2015)
	Mechanical Engineering Graduate Ambassador (2013-2015)
	President of VT Slackline Club (2011-2014)
	President of Japanese Conversation Group (2012-2015)
	President of Japanese Cultural Society in University of Wisconsin-EC (2005-2006)
Volunteer	Graduate student mentor (2014-Present)
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 Non-visible 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.