ABDULLAH AL REDWAN NEWAZ, PH.D.

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http://redwannewaz.github.io

EDUCATION

Japan Advanced Institute of Science and Technology (JAIST) *April 2014- March 2017*
Nomi, Ishikawa, Japan
Ph.D. in Information Science

Got Fostering ICT Global Leader Course Scholarship for young researchers.

Japan Advanced Institute of Science and Technology (JAIST) *April 2012-March 2014*
Nomi, Ishikawa, Japan
M.S. in Information Science

Got NTT DOCOMO Scholarship for International Students.

Rajshahi University of Science and Technology (RUET) *February 2007-August 2011*
Rajshahi, Bangladesh
B.Sc. in Mechanical Engineering

Got National Technical Education Scholarship for Outstanding Students.

EXPERIENCE

North Carolina Agricultural and Technical State University May 2020 - Present
Post-Doctoral Research Associate *Greensboro, North Carolina, USA*

- Written several grant proposals
- Research focus on Formal Method, Deep Learning, Multi-Agent System
- Developed and implemented several deep learning based pedestrian detection and tracking methods.
- Developed test-bed for self-driving cars.
- Developed and implemented Mixed Integer Linear Programming based Multi-agent motion planners.

Rice University April 2018 - April 2020
Post-Doctoral Research Associate *Houston, Texas, USA*

- Research focus on Formal Method, Machine Learning, Robot programming
- Designed and implemented scalable motion planning algorithms.
- Theoretical analysis of proposed algorithms.
- Demonstrated algorithms on a real robot.

Nagoya University March 2017 - March 2018
Post-Doctoral Research Associate *Nagoya, Aichi, Japan*

- Designed machine learning framework for anomaly detection of autonomous cars.
- Implemented deep learning algorithms for anomaly detection.
- Analyzing human driving behavior pattern utilizing developed algorithms.

Japan Advanced Institute of Science and Technology March 2012 - March 2017
Research Associate *Nomi, Ishikawa, Japan*

- Designed and implemented path and motion planning algorithms for Unmanned Aerial Vehicles (UAVs).
- Developed sensor fusion based localization system of UAVs in indoor GPS-denied environment.
- Implemented several realistic simulations in a physics-based simulator.
- Real-world demonstration of developed algorithms on a flying robot.

Seoul National University January 2013 - March 2013
Exchange Student *Seoul, Gwanak-gu, South Korea*

· Designed controllers for underdamped systems such as quadrotors.
· Studied MATLAB, LabView for modeling and simulation of quadrotors.

TECHNICAL STRENGTHS

- Experience in the field of robotics and development of autonomous systems
- Knowledge of ROS architecture and experiences with developing ROS nodes in the field of SLAM
- Knowledge of Deep learning architecture and experiences with developing deep leaning-based methods in the field of Perception and Control
- Experiences with programming in Linux, Windows, Mac operating systems
- Fluent in C++, Python, Matlab, Lua programming languages
- Experience in the field of combining sensory data (sensor fusion), optimization and sampling techniques.
- The ability to work in a multidisciplinary team with short development cycles (version control, e.g., GitHub, Bitbucket).

INVITED TALKS AND PRESENTATIONS

- NC-CAV (NC Transportation Center of Excellence on Connected and Autonomous Vehicle Technology), North Carolina, USA, 2020
- NC-DOT (NC Department of Transportation), North Carolina, USA, 2020
- RSS 2019 (Robotics: Science and Systems), Freiburg, Germany
- SIMPAR 2016 (IEEE Int'l Conf. on Simulation, Modeling, and Programming for Autonomous Robots), San Francisco, USA, 2016
- ICRA 2016 (IEEE Int'l Conf. on Robotics and Automation), Stockholm, Sweden, 2016
- RO-MAN 2013 (IEEE Int'l Symp. on Robot and Human Interactive Communication), Gyeongju, S. Korea, 2013
- ICMA 2013 (IEEE Int'l Conf. on Mechatronics and Automation), Takamatsu, Japan, 2013

AWARD AND RECOGNITION

- NTT Docomo Scholarship for master's program at JAIST, 2012
- Fostering ICT Global Leader Course Scholarship at JAIST, 2014
- The Presidential Award at Poster Presentation, 2013
- The Students' Choice Award at Poster Presentation, 2013
- Travel Grant, JAIST Research Grant for Students, 2013
- Travel Grant, NEC C&C Foundation Grants, 2016

TEACHING

- **Robotics** (Path Planning, Motion Planning, and ROS)
- **Optimal Control** (Reinforcement Learning)

PUBLICATION

1. Abdullah Al Redwan Newaz, Tauhidul Alam, Murad Reis Gregory, Leonardo Bobadilla, and Ryan N Smith. Long-term autonomy for auvs operating under uncertainties in dynamic marine environments. *IEEE Robotics and Automation Letters*, 2021

2. Laya Shamgah, Tadewos G. Tadewos, Abdullah Al Redwan Newaz, Ali Karimoddini, and Albert C. Esterline. Reactive symbolic planning and control in dynamic adversarial environments. *IEEE Transactions on Automatic Control*, 2021

3. Yue Wang, Abdullah Al Redwan Newaz, Juan David Hernández, Swarat Chaudhuri, and Lydia E Kavraki. Online partial conditional plan synthesis for pomdps with safe-reachability objectives: Methods and experiments. *IEEE Transactions on Automation Science and Engineering*, 2021

4. Tauhidul Alam, Abdullah Al Redwan Newaz, Leonardo Bobadilla, Wesam H Alsabban, Ryan N Smith, and Ali Karimoddini. Towards energy-aware feedback planning for long-range autonomous underwater vehicles. *Frontiers in Robotics and AI*, 8:7, 2021

5. Muhammad Mobaidul Islam, Abdullah Al Redwan Newaz, Balakrishna Gokaraju, and Ali Karimoddini. Pedestrian detection for autonomous cars: Occlusion handling by classifying body parts. In *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, pages 1433–1438. IEEE, 2020

6. Nantawat Pinkam, Abdullah Al Redwan Newaz, Sungmoon Jeong, and Nak Young Chong. Rapid coverage of regions of interest for environmental monitoring. *Intelligent Service Robotics*, 2019

7. Abdullah Al Redwan Newaz, Swarat Chaudhuri, and Lydia E Kavraki. Monte-carlo policy synthesis in pomdps with quantitative and qualitative objectives. *RSS*, 2019

8. Abdullah Al Redwan Newaz, Sungmoon Jeong, and Nak Young Chong. Online boundary estimation in partially observable environments using a uav. *Journal of Intelligent and Robotic Systems*, 90(3):505–514, 2018

9. Abdullah Al Redwan Newaz, Sungmoon Jeong, Hosun Lee, Hyejeong Ryu, Nak Young Chong, and Matthew T Mason. Fast radiation mapping and multiple source localization using topographic contour map and incremental density estimation. In *2016 IEEE International Conference on Robotics and Automation (ICRA)*, pages 1515–1521. IEEE, 2016

10. Abdullah Al Redwan Newaz, Sungmoon Jeong, Hosun Lee, Hyejeong Ryu, and Nak Young Chong. Uav-based multiple source localization and contour mapping of radiation fields. *Robotics and Autonomous Systems*, 85:12–25, 2016

11. Abdullah Al Redwan Newaz, Sungmoon Jeong, and Nak Young Chong. Fast radioactive hotspot localization using a uav. In *2016 IEEE International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAR)*, pages 9–15. IEEE, 2016

12. Abdullah Al Redwan Newaz, Ferdian Adi Pratama, and Nak Young Chong. Exploration priority based heuristic approach to uav path planning. In *2013 IEEE RO-MAN*, pages 521–526. IEEE, 2013

13. Abdullah Al Redwan Newaz, Geunho Lee, Ferdian Adi Pratama, and Nak Young Chong. 3D exploration priority based flocking of uavs. In *2013 IEEE International Conference on Mechatronics and Automation*, pages 1534–1539. IEEE, 2013

Under Review

1. Abdullah Al Redwan Newaz, Tauhidul Alam, Joseph Mondello, Jonathan Johnson, and Leonardo Bobadilla. Long-term autonomy for auvs operating under uncertainties in dynamic marine environments. *IEEE RO-MAN*, 2021

2. Tadewos G. Tadewos, Abdullah Al Redwan Newaz, and Ali Karimoddini. Specification-guided behavior tree synthesis and execution. *Journal of The Franklin Institute*, 2021

3. Muhammad Mobaidul Islam, Abdullah Al Redwan Newaz, ..., and Ali Karimoddini. Connected autonomous vehicles: State of practice. In *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*. IEEE, 2021

4. Muhammad Mobaidul Islam, Abdullah Al Redwan Newaz, and Ali Karimoddini. A pedestrian detection and tracking framework for autonomous cars: Efficient fusion of camera and LiDAR data. In *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*. IEEE, 2021

5. Muhammad Mobaidul Islam, Abdullah Al Redwan Newaz, Renran Tian, and Ali Karimoddini. Single shot pedestrian detection with body parts semantics. In *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*. IEEE, 2021

6. Muhammad Mobaidul Islam, Abdullah Al Redwan Newaz, and Ali Karimoddini. Pedestrian detection for autonomous cars: Inference fusion of deep neural networks. In *IEEE Transactions on Intelligent Transportation Systems*. IEEE, 2021

Under Preparation

1. William H. Gray, Abdullah Al Redwan Newaz, ..., and Ali Karimoddini. Smart agriculture: Multi-uav tasking and coordination for monitoring and coverage of agricultural farm lands. In *IEEE Internet of Things Journal*. IEEE, 2021

2. Abdullah Al Redwan Newaz and Ali Karimoddini. Logically constrained behavior tree synthesis for integrated task and motion planning under uncertainties. In *IEEE Transactions on Cybernetics*. IEEE, 2021

Dissertation

1. Abdullah Al Redwan Newaz. Uav-based topographic mapping and source localization of the radiation field. *Japan Advanced Institute of Science and Technology*, 2017. Doctoral dissertation

2. Abdullah Al Redwan Newaz. Development of teleoperated and semi-autonomous aerial vehicles. *Japan Advanced Institute of Science and Technology*, 2014. Master's thesis

SERVICE

- Reviewer for International Conference on Robotics and Automation
- Reviewer for IEEE Robotics and Automation Letters
- Reviewer for IEEE International Symposium on Robot and Human Interactive Communication
- Reviewer for IEEE Conference on Decision and Control
- Reviewer for American Control Conference
- Reviewer for Journal of Intelligent & Robotic Systems, Springer