Thilanka Munasinghe

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Education

Master of Science in Mechanical Engineering (Expected Graduation: December 2015)
West Virginia University, WV, USA.
Advisor: Dr. John Kuhlman.
Thesis: Studying the Characteristics of Bubble Motion in Pool Boiling in Microgravity Conditions Under the Influence of a Magnetic Field.

Master of Science in Applied Mathematics (Expected Graduation: December 2015)
West Virginia University, WV, USA
Advisor: Dr. Marjorie Darrah.
Thesis: "Cooperative Control of Multi-Agent Systems (UAVs) Using Genetic Algorithms for Tasking Teams".

Bachelor of Science in Aerospace Engineering (Graduated in 2008)
West Virginia University, WV, USA.

Project Experience

2015 June- Present — **WVU - NASA Cube-Satellite Simulation-to-Flight 1 (STF-1) Small Satellite.**
Currently implementing the onboard communication application that communicates with NASA Core Flight Executive Flight Software framework and onboard computer along with other integrated applications in the system. I am also assisting the team to conduct Failure Mode Effects Analysis on custom Printed Circuit Boards, and to simulate the Gage Repeatability & Reproducibility to evaluate the quality of the system's measurements. This project mission is compliant with all requirements placed upon it by the launch vehicle as specified in LSP-REQ-317.01A, GSFC-STD700A, NASA-STD-6016 and MIL-STD-1540C.

2014 Feb – 2014 May: — **Visiting Research Student at Laboratory for Autonomous Marine Sensing Systems, MIT.**
Worked with the MIT underwater robotic research group to develop autonomous decision-making path planning software in C++ for Autonomous Under Water Vehicles (AUVs).

2013 May – 2013 August: **Visiting Research Student at Laboratory for Autonomous Marine Sensing Systems, MIT.**
Developed a smooth curve path-planning algorithm for MIT MOOS-IvP open source software for AUVs.

2011 May – 2013 July: **Research Assistant at Mathematics Department, WVU.**
Developed Genetic Algorithms (GA) and undertook Genetic Algorithm programming for cooperative control and Task management for multi-agent systems.

2012 Jan – 2012August: **Research Intern at Information Research Corporation, Fairmont, WV.**
Assisted during the process integrating the Genetic Algorithm software to a ground control station, and tested the system on Unmanned Aerial Vehicles (UAVs).

2010 Jan– 2011 May: **Research Assistant at Mechanical and Aerospace Engineering.**
Conducted image-processing work on the captured images of the videos of pool boiling during microgravity environment experiments.

2005 Aug– 2006 September: **WVU UROP (Undergraduate Research Opportunities) Student Member of the WVU microgravity research team.**
Designed equipment for the experiments of the WVU microgravity research project. Conducted the experiment designed to study the Kelvin Force Effect on Bubbles in paramagnetic liquids under microgravity conditions inside the *ZeroG* flight at Kennedy Space Center, Florida.

2005 January– 2005 May: **WVU High Altitude Balloon Satellite Project student member.**
Designed CAD models and the actual payloads, which were attached to the central payload code of helium filled balloon that carried the small payloads up to the 80,000 feet altitude. Assisted in the integration the self-deploying parachute to the balloon and tested their survivability prior to launch. Participated during the launch of the balloon and the recovery of the payloads after successful landing.

2003 Jun – 2004 Aug: **Intern at Arthur C. Clarke Institute for Modern Technology, Moratuwa, Sri Lanka.**
I conducted meteorite testing and studied the characteristics and composition of meteorites found in Sri Lanka and India. Collaborated with the Geological Survey of India in analyzing an iron meteorite.

Teaching Experience

2014 Aug – Present	Instructor and Graduate Assistant at WVU Office of Innovation, Entrepreneurship and Commercialization (LaunchLab); I taught Java Programming and Android application development to over 50 students.
Fall 2011:	Math Tutor at Mathematics Learning Center, Department of Mathematics WVU.
Aug 2005 – May 2010:	Math and Physics Tutor at WVU Engineering Learning Center.
Summer & Fall 2009:	Instructor for Engineering 102 (Intro to Engineering II), College of Engineering.
Spring 2009:	Instructor for Engineering 101 (Intro to Engineering I), College of Engineering.
Fall 2008:	Teaching Assistant University 101, Residential Education WVU.

Programming Skills

- Proficient in Object Oriented Programming using JAVA and C++
- Proficient in Mobile Application Development using the Android Platform
- Proficient in Scientific Computing using Matlab and R
- Proficient in Design Tools such as AutoDesk (AutoCAD) and Solid Works

Awards

- **Best Business/Project Idea and Most Technically Interesting** Project Award at the Big Travel Data Hackathon 2013, organized by Hack Reduce for ***FlightR***.
- **Resident Assistant (RA) of the Year** Award of West Virginia University Dadisman Hall, 2008-2009 Academic Year.
- **Recognition Award from Sir Arthur. C. Clarke** for the meteorite and planetary science research 2003.

Invited Talks

- "Fluids and Bubble Motion Behavior in Microgravity Conditions" at Arthur C. Clarke Institute for Modern Technology, Sri Lanka; May 2010.
- "High Altitude Balloon Satellites" at American National College, Sri Lanka; June 2007.
- Guest Speaker at S.Thomas' College Mt.Lavinia to address the College Teaching Staff on "How to Teach High School Students Effectively" invited by Warden Dr. Indra De Soysa, Jan 2014.

PUBLICATIONS

Journal Publications

- A Flexible Genetic Algorithm System for Multi UAV Surveillance: Algorithm and Flight Testing. Journal Unmanned Systems. *Marjorie Darrah, Jay Wilhelm, Thilanka Munasinghe, Mitch Wathen, Steve Yokum, Eric Sorton*. 7th January 2015.
- Using Genetic Algorithms for Tasking Teams of Raven UAVs. Journal of Intelligent and Robotics Systems, *Marjorie Darrah, Edgar Fuller, Thilanka Munasinghe, Kristin Duling, Mridul Gautam, Mitchell Wathen.* 20th July 2012.

Conference Publications

- Dynamic and Kinematic Characteristics of Bubble Flow Motion in Paramagnetic Liquid under Microgravity Conditions. International Conference on Fluid Flow Dynamics (ICFD), Sendai, Japan, *Thilanka Munasinghe,* November 2009.
- Investigating Bubble Expansion in Pool Boiling Under Influence of Magnetic Field in Microgravity Conditions. World Scientific and Engineering Academy and Society, (WSEAS), Moscow, Russia, *Thilanka Munasinghe, Sanket Joshi.* August 2009.
- Transformation Mapping of Bubbles' 2-D Circular Shape to an Elliptical Shape Under Influence of a Magnetic Field in Pool Boiling in Microgravity Conditions. 5th MIT Conference on Computational Fluid and Solid Mechanics, Massachusetts Institute of Technology (MIT), Cambridge, MA, *Thilanka Munasinghe.* June 2009.
- Studying the Characteristics of Bubble Motion in Pool Boiling in Microgravity Conditions Under the Influence of a Magnetic Field. Recent Advances on Space Technology (RAST), IEEE – AIAA Joint Conference, Istanbul, Turkey. *Thilanka Munasinghe*. June 2009.
- Investigating Bubble Behavior in Pool Boiling in Microgravity Conditions, World Congress on Engineering (WCE), International Association of Engineers (IAENG), Imperial College, London, UK, *Thilanka Munasinghe*, July 2008.

Poster Presentations

- Efficient Path Planning Algorithms for AUVs. Google Research Labs Conference, June 2014.
- Laminar to Turbulent Transition in Fluid Flow in Boiling, AIAA Young Professional and Student Education Conference, John Hopkins University, Baltimore, Maryland, November, 2008.
- Boling in Microgravity, AIAA Student Conference, University of Maryland, College Park, April, 2008.
- "Research Day at Capitol - 2008", Governor's Chamber, Charleston, West Virginia. January 2008.
- "WV-NANO", West Virginia University, Alumni Center, May 2009.

Professional Service

Mar 2014 – May 2014:	Member of the MIT Cricket Team
Aug 2005 – May 2008:	Senior Mentor at Office of International Students and Scholars
Jul – Dec 2008:	Member of the Student Conduct Board of WVU
2007 – 2008:	Vice President, International Student Association WVU
2007 – 2009:	Member of the WVU Cricket Club
2007 – 2008:	Member of Multi-Cultural Leadership Club WVU
Aug 2005 – Dec 2008:	Member of Hall Council, Dadisman & Stalnaker Hall
2000 – 2004:	Member of Sri Lanka Student Red Cross Society

References

Mr. Matt Harbaugh
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Dr. Marjorie Darrah
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Dr. Robin Hensel
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Prof. Eddie Fuller
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Prof. David Stewart
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