

PERSONAL DETAILS

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EDUCATION

Ph.D. Candidate 2014-present

University of Nevada (Reno, NV, USA)

Thesis research area: Mobile Ad hoc Networks Performance for Emergency Situations. Advisor: Dr. Shamik Sengupta. Expected graduation: May 2019.

B.Sc. in Telecommunications Engineering 2006-2011

Universidade Regional de Blumenau (Blumenau, SC, Brazil)

Senior thesis: Feasibility study of a digital television channel according to ABNT standard.

RESEARCH INTEREST

Wireless networks

Cross-layer optimization, decentralized networks, heterogeneous networks, ad hoc network, unmanned autonomous systems, 3D wireless mesh, resource management, testbed implementation, experiment evaluation.

Service coverage

3D mobility models, obstacle avoidance, node deployment/placement, map coverage, dynamic coverage.

Cybersecurity

Jamming attack prevention/mitigation, cyber-physical security, mobile computing privacy.

RESEARCH PROJECTS

Longevity of multi-channel multi-radio wireless mesh networks 2017-present

Lead student

- Implemented a wireless mesh network testbed with low-cost commercial-off-the-shelf components to enable evaluation of energy-aware protocols in real scenarios.
- Increased overall *ad hoc* network lifetime by roughly 12% using a distributed routing protocol with novel link metric using cross-layer information.
- Augmented the amount of data assignment by over 100% using different greedy algorithms to allocate traffic flows to links in a multi-radio multi-channel *ad hoc* network.

Node positioning in wireless networks 2018-present

Research fellow

- Achieved 60% accuracy in an RSSI-constrained robot network by using ROS and ZigBee modules to enable custom algorithm for search and rescue operations.
- Proposed a positioning mechanism guaranteeing 100% map coverage for temporary backbone network to assist first-responders in disaster situations with dynamic area of interest by using a combination of Delaunay triangulation with a greedy algorithm.
- Increased data transfer rate in a UAV backbone network by 10.7% using a combined channel bonding, channel aggregation, and physical re-positioning of UAVs.

Research fellow

- Proposed stochastic model for beam-forming antenna using Kalman filtering technique to track and predict movement trajectory of a mobile jammer with discrete direction-of-arrival estimation.
- Explored adaptive beam-forming as a mitigation mechanism against mobile jamming attack in multi-hop wireless *ad hoc* networks.
- Implemented three obstacle compliant 3D mobility models for UAVs in *ns-3*.

PUBLICATIONS

JOURNALS

- J6 **P. A. Regis**, A. N. Patra, S. Sengupta. **Low-cost wireless testbed development for fast energy-aware network prototyping and evaluation.** *Elsevier Simulation Modelling Practice and Theory*. Under review.
- J5 A. N. Patra, **P. A. Regis**, S. Sengupta. **Dynamic and Distributed Self-Reconfiguration of UAVs to Serve Overloaded Hotspot Cells.** *Elsevier Computers and Electrical Engineering*. Under review.
- J4 A. N. Patra, **P. A. Regis**, S. Sengupta. **Distributed Allocation and Dynamic Reassignment of Channels in UAV Networks for Wireless Coverage.** *Elsevier Pervasive and Mobile Computing*. Under review.
- J3 S. Bhunia, **P. A. Regis**, S. Sengupta. **Distributed Adaptive Beam Nulling to Survive Against Jamming in 3D UAV Mesh Networks.** *Elsevier Computer Networks*. 137:83 – 97, 2018.
- J2 **P. A. Regis**, C. Miley, S. Sengupta. **Multi-hop Mobile Wireless Mesh Network Testbed Development and Measurements.** *International Journal of Innovative Research in Computer and Communication Engineering*. Vol. 5, Issue 8, August 2017.
- J1 S. Bhunia, V. Behzadan, **P. A. Regis**, S. Sengupta. **Adaptive Beam Nulling in Multihop Ad hoc Networks Against a Jammer in Motion.** *Elsevier Computer Networks. Special issue on Recent Advances in Physical-Layer Security*. 109:50 – 66, 2016.

CONFERENCES

- C6 T Brodeur, **P. A. Regis**, D. Feil-Seifer, S. Sengupta. **Search and Rescue Operations with Mesh Networked Robots.** *To appear in IEEE UEMCON 2018*. New York City, New York.
- C5 **P. A. Regis**, A. N. Patra, S. Sengupta. **Unmanned Aerial Vehicles Positioning Scheme for First-responders in a Dynamic Area of Interest.** *In IEEE VTC 2018-Fall*. Chicago, Illinois.
- C4 **P. A. Regis**, S. Sengupta. **Distributed Split-Path Routing Strategy for Multi-hop Mesh Networks.** *In IEEE MILCOM 2017*. Baltimore, Maryland.
- C3 **P. A. Regis**, S. Bhunia, S. Sengupta. **Enhancing Performance and Longevity of Multi-radio Multi-channel HetNets through Dynamic Path-assignment.** *In IEEE International Conference on Computing, Networking and Communications (ICNC) 2017*. Santa Clara, California.
- C2 **P. A. Regis**, S. Bhunia, S. Sengupta. **Implementation of 3D Obstacle Compliant Mobility Models for UAV networks in ns-3.** *In Workshop on ns-3 (WNS3) 2016*. Seattle, Washington.
- C1 S. Bhunia, V. Behzadan, **P. A. Regis**, S. Sengupta. **Performance of Adaptive Beam Nulling in Multihop Ad-Hoc networks under Jamming.** *In IEEE International Symposium on Cyber-space Safety and Security (CSS) 2015*. Elizabeth, New York.

POSTER PRESENTATION

P1 **P. A. Regis**, C. Miley, S. Sengupta. **Building a Testbed for Mobile Wireless Mesh Networks**. *BRASCON 2017*. Los Angeles, California.

PROFESSIONAL EXPERIENCE

Instructor, *Department of Computer Science and Engineering* Spring-2019
Computer Communication Networks (CPE 400/600). Average enrollment 100+ students.

Research Assistant, *University of Nevada Reno* 2014-present
Conduct and publish research articles within the scope of the Networks Lab.

Teaching Assistant, *University of Nevada Reno* 2017-present
Courses: Computer Communication Networks, Introduction to Engineering Design.

Instructor, *University of Nevada Reno* 2017-2018
Research Experience for Teachers: Cybersecurity Initiative for Nevada Teachers (NSF Award #1542465). Research Experience for Undergraduates: Collaborative Human Robot Interaction (NSF Award #1757929).

Web/Mobile Developer, *Wizze, Blumenau, SC, Brazil* 2013-2014
iOS (native) and Android (Appcelerator) development, Symfony Framework, Wordpress.

IT manager, *Rischbieter Engenharia, Gaspar, SC, Brazil* 2010-2013
Active Directory and infrastructure maintenance (firewall, fileserver). Software maintenance (licensing, support), Workstation maintenance. Telephony (wired/wireless) management.

PROFESSIONAL ACTIVITIES

SESSION CHAIR AT INTERNATIONAL CONFERENCES

Vehicular Technology Conference (IEEE VTC) 2018-Fall
Chicago, IL, USA.
Track: Optimization and Design in IoT, M2M, Sensor Networks, and Ad-Hoc Networking.

TECHNICAL PROGRAM COMMITTEE

International Conference on Information Technology (ICIT) 2016
ICIT. Bhubaneswar, India.
Member of the technical program.

PEER REVIEWER

Journal

Elsevier Computer Communications, International Journal of Distributed Sensor Networks, IETE Technical Review, Journal of Computer Networks and Communications (Hindawi)

Conference

Conference on Decision and Game Theory for Security (GameSec), IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM), IEEE ICIT, IEEE Canadian Conference on Electrical and Computer Engineering (CCECE).

STUDENT SUPERVISION

Under NSF Award IIS-1757929.

Tristan Brodeur

2018-Summer

Undergraduate

Topic: testbed development for search and rescue networked robots using Robot Operating System. Email: brodeurtristan@gmail.com

Joshua Thomas

2018-Summer

Undergraduate

Topic: security and privacy in robotics systems using Robot Operating System. Email: thomaj10@unlv.nevada.edu

RELEVANT PROJECTS AND SKILLS

Incremental Learning, *Python/TensorFlow*

Spring-2018

Successfully updated the Inception model (TensorFlow) with new customized classes and training data for image classification.

Network Stack Emulation, *Java*

Spring-2016

Implemented high-level emulation of reliable network communication features: fragmentation, reliable end-to-end transmission, routing logic.

Consensus Algorithm, *Python*

Fall-2015

Implemented Consensus filtering algorithm for multi-agent data sensing.

Sensor fusion (GPS/IMU), *Python*

Fall-2015

Implemented GPS and IMU sensor fusion using Kalman filter.

Face Recognition, *Python*

Spring-2015

Implemented face-recognition algorithm using the Eigenfaces method.

Web crawler, *Python*

Fall-2014

Implemented a crawler to gather data from millions of subreddits, posts, and comments section from the Reddit platform.

Miscellanea: NumPy, SymPy, Pandas, Matplotlib, Django, NodeJS, Webpack, VueJs. Linux OS, Android (Java/Cross-platform), iOS (Objective-C), Firebase SDK. Network simulator 3 (ns-3), ns-2, hardware interfacing library using I2C bus.

Languages: Portuguese (native), English (fluent), Spanish (basic).

FELLOWSHIPS AND AWARDS

Science without Borders (CAPES) Doctorate Fellowship

2014-2018

CAPES Brazil - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

Council Member of the Semester Award

2017-Spring

University of Nevada Reno. Graduate Student Association.

Travel awards

IEEE VTC (2018-Fall), IEEE MILCOM (2017), BRASCON 2017, IEEE WNS3 2016, IEEE CSS 2015

SERVICE

Service Committee member Graduate Student Association, University of Nevada Reno	2017-2018
Events Committee member Graduate Student Association, University of Nevada Reno	2016-2018
Awards Committee member Graduate Student Association, University of Nevada Reno	2016-2017
College of Engineer representative Graduate Student Association, University of Nevada Reno	2016-2018
Vice-president CSE Graduate Student Club, University of Nevada Reno	2015-2016
Committee member Unity in Diversity, University of Nevada Reno	2016-2017
Committee member Graduate Poster Symposium, University of Nevada Reno	2016
Coordinator CSE Poster Exhibition, University of Nevada Reno	2016