

Paulo Alexandre Regis, Ph.D.

Assistant Professor

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EDUCATION

Ph.D. in Computer Science and Engineering 2014-2019

University of Nevada (Reno, NV, USA). GPA: 3.907

Disertation title: Smart-Cities enabled by Heterogeneous Networks.

Advisor: Dr. Shamik Sengupta.

B.Sc. in Telecommunications Engineering 2006-2011

Universidade Regional de Blumenau (Blumenau, SC, Brazil)

WORK EXPERIENCE

Assistant Professor, *Department of Computer Science, Southeastern Louisiana University* 2019-present

Courses taught:

- CMPS 494/594 (Special Topics in Computer Science): Spring 2020.
- CMPS 479 (Automata and Formal Languages): Spring 2020.
- CMPS 409 (Advanced Computer Networking): Fall 2019.
- CMPS 280 (Algorithm Design and Implementation II): Spring 2020.
- CMPS 209 (Introduction to Applied Networking): Fall 2019.
- CMPS 161 (Algorithm Design and Implementation I): Fall 2019.

Instructor, *Department of Computer Science and Engineering, University of Nevada Reno* Spring 2019

Computer Communication Networks (CPE 400/600):

- Topics covered: all Network stack layers, top-down approach.
- Core computer science course, 50+ enrollment.
- Autonomy over syllabus, evaluation, grading.
- Evaluation method: quizzes, homework assignments, midterm, programming project and final exam.

Research Assistant, *University of Nevada Reno* 2014-2019

Member of the Networks Lab:

- Execute research on mobile ad hoc networks.
- Publish scientific papers in relevant venues.
- Collaboration with colleagues in networking research topics.

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).

- (RET) Introductory lecture on wireless networks and related security topics.
- (RET) Mentor and assist teachers during their demonstration activities.
- (REU) Mentor undergraduate students during summer camp.

- (REU) Evaluate undergraduate research milestones, provide feedback and directions.
- (REU) Assist in the write up of a scientific paper.

Teaching Assistant, University of Nevada Reno

2016-2018

Courses: Computer Communication Networks, Introduction to Engineering Design.

- Grading quizzes, homework assignments, programming projects, exams.
- Hold office hours.
- Teach lab sessions.

Web/Mobile Developer, Wizze, Blumenau, SC, Brazil

2013-2014

Developed several solutions for different types of customers.

- Develop websites (front and backends) using Wordpress.
- Used Symfony framework (PHP) for customized backend.
- Developed a voting system (web and mobile) for a music festival.
- Soundcloud integration into mobile application.
- Cross-platform (iOS/Android) mobile application publication (App Store/Google Play).

IT Administrator, Rischbieter Engenharia, Gaspar, SC, Brazil

2010-2013

System administrator overseeing over 20 employees:

- Active Directory services and infrastructure.
- System (firewall, file server, print server) administrator: backup, update, diagnosis.
- Software administration: licensing, support, update.
- Network administrator: wired/wireless, telephony.

RESEARCH INTEREST

Wireless networks

Machine learning applied to networking, cross-layer optimization, sensor networks, decentralized networks, heterogeneous networks, ad hoc network, unmanned autonomous systems, 3D wireless mesh, resource management, testbed implementation.

Cybersecurity

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

Network positioning and deployment

3D mobility models, obstacle avoidance, node deployment/placement, map coverage, self-configuring networks.

PUBLICATIONS

JOURNALS

- 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*. Accepted.
- 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*. Accepted.

- 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

- C7 L. Ruetten, **P. A. Regis**, D. Feil-Seifer, S. Sengupta. **Area-Optimized UAV Swarm Network for Search and Rescue Operations**. In *IEEE CCWC 2020*. Las Vegas, Nevada.
- C6 T. Brodeur, **P. A. Regis**, D. Feil-Seifer, S. Sengupta. **Search and Rescue Operations with Mesh Networked Robots**. 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 Cyberspace Safety and Security (CSS) 2015*. Elizabeth, New York.

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.

Attack mitigation in multi-hop 3D UAS networks 2014-2018
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*.

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.

STUDENT SUPERVISION

Under NSF Award IIS-1757929 (REU).

Nicholas Ceccarelli , Undergraduate (SUNY University at Buffalo)	Summer 2019
Laik Ruetten , Undergraduate (University of Wisconsin, La Crosse)	Summer 2019
Tristan Brodeur , Undergraduate (University of Nevada, Las Vegas)	Summer 2018
Joshua Thomas , Undergraduate (University of Nevada, Las Vegas)	Summer 2018

PROFESSIONAL ACTIVITIES

SESSION CHAIR AT INTERNATIONAL CONFERENCES

Vehicular Technology Conference (IEEE VTC)

Fall 2018

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).

RELEVANT PROJECTS AND SKILLS

Technical (general): technical writing (academic writing, source-code documentation), engineering (machine learning, exploratory data analysis, feature engineering).

Programming: Python (Pandas, NumPy, Seaborn, scikit-learn, Matplotlib, Keras), C/C++ (I2C, ns-3), JavaScript (NodeJS, Express, Firebase).

Networking: Internet stack protocols (advanced), wireless ad hoc protocols (advanced), Wireshark/tcpdump (intermediate), network simulator ns-3 (advanced: mobility models, routing, MAC layer), pfSense (intermediate).

SERVICE AND LEADERSHIP

Council Member, Graduate Student Association, University of Nevada Reno 2016-2018

- College of Engineering representative
- Events Committee member (2016-2018)
- Service Committee member (2017-2018)
- Awards Committee member (2016-2017)
- Graduate Poster Symposium, organizing committee (2016)
- Unity in Diversity, organizing committee (2016-2017)

Vice-president, CSE Graduate Student Club, University of Nevada Reno 2015-2016

- CSE Poster Exhibition, organizing committee (2016)
- Lab Socials, organizing committee (2015-2016)

FELLOWSHIPS AND AWARDS

Enhancement Grant 2019
Southeastern Louisiana University. Center for Faculty Excellence

Science without Borders (CAPES) Doctorate Fellowship 2014-2018
CAPES Brazil - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

Council Member of the Semester Award Spring 2017
University of Nevada Reno. Graduate Student Association.

Travel awards

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