

Sara Rampazzi

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Computer Science and Engineering
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Research areas Embedded hardware security, embedded systems design, modeling, and simulation with application to medical devices, automotive, and the Internet of Things.

Education **PhD in Electronics, Computer Science and Electrical Engineering**
University of Pavia (Italy), **2014**.
Thesis: Embedded system for Lab-On-Chip biosensors
Advisor: Giovanni Danese

MEng in Computer Science Engineering
University of Pavia (Italy), **2010**.
Thesis: Design and implementation of a portable device for multi-parameter analysis based on Surface Plasmon Resonance
Advisor: Francesco Leporati

BS in Computer Science Engineering
University of Pavia (Italy), **2008**.

Academic positions **Research Investigator** **Feb 2018-present**
Electrical Engineering & Computer Science,
University of Michigan

Intermittent Lecturer **Jan 2019-present**
Electrical Engineering & Computer Science,
University of Michigan

Affiliate Researcher **Aug 2017-Jan 2018**
Electrical Engineering & Computer Science,
University of Michigan

Postdoc fellow **2014**
Computer Science Engineering,
University of Pavia

Research experience **Principal Researcher for MCity PASS project** **2018-present**
University of Michigan
The Protecting Automotive Analog Sensor Security (PASS) project aims to protect sensors at the analog layer to enable automotive systems to better assess the trustworthiness of input from untrusted sensors.

Senior personnel on THAW**2018-present**

University of Michigan

The Trustworthy Health and Wellness (THAW) is an NSF-funded project that tackles the fundamental challenges necessary to provide trustworthy information systems for health and wellness.

Visiting researcher**Spring 2014**

Integrated System Design Division

Univ. de Las Palmas de Gran Canaria (*Spain*)

Researcher project on Support Vector Machine (SVM) for Hyperspectral Images classification in healthcare.

**Teaching
experience****Intermittent Lecturer****Winter 2019***Course: EECS 496 - Major Design Experience Professionalism*

Department of Electrical Engineering and Computer Science,
University of Michigan

Topic: Design principles for multidisciplinary team projects, team strategies, entrepreneurial skills, ethics, social and environmental awareness, and life long learning.

Instructor of record**2013-2014***Course: C coding*

Department of Mathematics, University of Pavia

Topic: Ansi C PL syntax and static and runtime semantics.**Instructor of record****2010-2012***Course: Introduction to Computer Systems II*

Computer Science Engineering, University of Pavia

Topic: introduction to web programming, HTML, CSS, JAVASCRIPT language syntax and examples of application.

Teaching Assistant**2007-2010***Course: Introduction to Computer Systems*

Computer Science Engineering, University of Pavia

Topic: Ansi C PL syntax and semantics.**Industry
experience****Firmware developer for LTE systems****2016-2017***Azcom Technology**Client: Blue Danube Inc.*

Project: Firmware and software developer for smart antenna based wireless network.

Software engineer consultant**2015-2016***Alten Italia**Client: Leonardo S.p.A.*

Project: Embedded software developer for the spacecraft EUCLID Command and Data Handling (C&DH) system and orbit control.

Client: Magneti Marelli (Fiat Chrysler Automobiles Group)

Project: Model-based design engineer for HMI in automotive cluster area.

**Refereed
conference
publications**

Sara Rampazzi*, Yazhou Tu, Bin Hao, Angel Rodriguez, Kevin Fu, and Xiali Hei, “**Trick or Heat? Attack on Amplification Circuits to Abuse Critical Temperature Control Systems**”, accepted in ACM CCS, Nov 2019.

* co-first and
corresponding
author

Yulong Cao, Chaowei Xiao, Benjamin Cyr, Yimeng Zhou, Won Park, Sara Rampazzi°, Qi Alfred Chen, Kevin Fu, Z. Morley Mao, “**Adversarial Machine Learning on LIDAR-based Object Detection in Autonomous Driving**”, accepted in ACM CCS, Nov 2019.

° corresponding
(senior) author

Connor Bolton, Sara Rampazzi, Chaohao Li, Andrew Kwong, Wenyan Xu, Kevin Fu, “**Blue Note: How Intentional Acoustic Interference Damages Availability and Integrity in Hard Disk Drives and Operating Systems**”. In *Proceedings of the 39th Annual IEEE Symposium on Security and Privacy*, May 2018.

Sara Rampazzi, Francesco Leporati, Giovanni Danese, Marabelli Franco, Andrea Valsesia, “**A Novel Portable Surface Plasmon Resonance Based Imaging Instrument for On-Site Multi-Analyte Detection**”. In *Federated Conference on Computer Science and Information Systems (FedCSIS '13)*, Sept. 2013, pp. 619-626.

Sara Rampazzi, Giovanni Danese, Lucia Fornasari, Francesco Leporati, Franco Marabelli, Nelson Nazzicari, Andrea Valsesia, “**Lab On Chip: Portable Optical Device for On-Site Multi-parametric Analysis**”. In *IEEE Euromicro Conference on Digital System Design (Euromicro DSD'13)*, 4-6 Sept 2013, pp. 807-810.

**Refereed
journal
publications**

Simone Marini, Francesca Vitali, Sara Rampazzi, Andrea Demartini, Tatsuya Akutsu, “**Protease target prediction via matrix factorization**”. In *Bioinformatics*, 29 Aug. 2018, bty746.

Sara Rampazzi, Giovanni Danese, Francesco Leporati, Franco Marabelli, “**A Localized Surface Plasmon Resonance-Based Portable Instrument for Quick On-Site Biomolecular Detection**”. In *IEEE Transactions on Instrumentation and Measurement*, Vol. 65 Is. 2, 1 Dec. 2015, pp. 317-327.

Posters

Yulong Cao, Chaowei Xiao, Benjamin Cyr, Yimeng Zhou, Won Park, Sara Rampazzi, Qi Alfred Chen, Kevin Fu, Z. Morley Mao, “**Adversarial Sensor Attack on LIDAR-based Perception in Autonomous Driving**”, Accepted to AdvMLCV2019 (CVPR 2019 Workshop on Adversarial Machine Learning in Real-World Computer Vision Systems), June 2019.

Angel Rodriguez, Sara Rampazzi and Kevin Fu, “**IoT Two Factor Neurometric Authentication System using Wearable EEG**”. In the Poster Session of the IEEE Workshop on the Internet of Safe Things (SafeThings 2019), May 2019.

Connor Bolton, Sara Rampazzi, Chaohao Li, Andrew Kwong, Wenyan Xu, Kevin Fu, “**Blue Note: How Intentional Acoustic Interference Damages Availability and Integrity in Hard Disk Drives and Operating Systems**”. In the Poster Session of the 39th Annual IEEE Symposium on S&P, May 2018.

Patents issued	Sara Rampazzi, Giovanni Danese, Lucia Fornasari, Francesco Leporati, Franco Marabelli, Nelson Nazzicari, Andrea Valsesia “Detection device of molecular compounds based on Surface Plasmon Resonance” . European patent #IT2013MI01345 20130806. Priority 2013. Issued 2015.
Invited talks and seminars	<p>“Protecting Cyber-physical Systems from Physical Attacks” Invited seminar, University of California Santa Barbara, Security Lab, 05/23/2019</p> <p>“Cybersecurity in Hospitals: comparing EU and US strategies” Seminar & discussion panel in second level postgraduate Master in Cyberlaw and Policies for Digital Innovation, University of Milan, Bicocca, 12/19/2018</p> <p>“Cybersecurity and Implantable Devices”. In Women in Electrophysiology, Medical Education - Medtronic Accademy, 10/13/2018</p> <p>“Fear The Hacked IoT Medical Devices: the apocalypse is already happening, and no one noticed?”. In Proceedings of USENIX 2018 Summit on Hot Topics in Security (HotSec 18), 08/14/2018</p> <p>“Sensor Security in Cyber-Physical Systems”, seminar for graduate students of the Ph.D. School of Electrical and Electronics Engineering and Computer Science, University of Pavia, 07/15/2018</p> <p>“Portable Lab-on-chips for biomolecular detection”, seminar in first level postgraduate Master and Specialization Course in Clinical Engineering, University of Pavia, 04/12/2016</p> <p>“A Novel Portable Surface Plasmon Resonance Based Imaging Instrument for On-Site Multi-Analyte Detection”. Conference presentation in the 6th International Symposium on Multimedia Applications and Processing, colocated event of FedCSIS 2013, 9/10/2013.</p>
Service to profession	<p>Technical Program Committee Member of SafeThings 2019 - IEEE Workshop on the Internet of Safe Things Colocated with 2019 IEEE Symposium on Security and Privacy May 20-22, 2019 - San Francisco, California, USA</p> <p>Peer Reviewer ACM Transactions on Privacy and Security; 2019 - <i>present</i> ACM Transactions on Computing for Healthcare; 2019 - <i>present</i> Science Magazine; 2018 - <i>present</i> Sensors; 2016 - <i>present</i></p> <p>NSF SaTC grant proposal review panelist Panelist reviewer for small (500K) grant proposals on the Secure and Trustworthy Cyberspace (SaTC) program of the National Science Foundation; 2018</p>

Consultant for Archimedes, Center of Medical Device Security

University of Michigan, 2018-*present*

Archimedes is an independent center created to help medical device manufacturers, industry experts and physicians to navigate the operational hazards of cybersecurity implementation in healthcare.

Mentoring & Advising**Computer Engineering Undergraduate Advisor**

University of Michigan, Winter 2019

Helping students in the undergraduate programs offered through the Electrical Engineering and Computer Science Department.

Mentor for the First Generation Engineering Program

University of Michigan, 2018-*present*

The purpose of the program is to bring first generation Michigan Engineering students (undergraduate & graduate) together to build the community, and share resources and experiences.

Society of Women Engineers Summer Camp mentor

University of Michigan, Summer 2018

Summer Engineering Exploration (SEE) Camp mentor for high school students interested in engineering and security in Cyberspace.

IEEE Student Branch Computer Science Area Advisor

IEEE Pavia Student Branch, Region 8, Italian section,
University of Pavia, 2011-2014.

Introducing computer science engineering undergraduate students to research and future professions.

Organization committee member

Euromicro SEAA 2014/ DSD 2014 Conference, Verona (Italy), 2014

Technical Skills

PLs: Matlab, C, Perl, Java

Design/Modelling/
Simulation tools: Matlab-Simulink, COMSOL Multiphysics, StateFlow, IBM Rational Rhapsody.

Programming/
Validation/Testing
tools: IBM Rational Logiscope, GNURadio, QA System Cantata++, dSpace Target Link, MPLAB, MikroC for PIC and ARM

Languages

Italian	Native speaker
English	Fluent
Spanish	Fluent