Marco La Manna | CV

[Address omitted for website]
[Omitted for website] • [Omitted for website]
[Omitted for website] • [Omitted for website]
biostat.wisc.edu/∼ mlamanna
Linkedin: www.linkedin.com/in/marcolamanna1986

Research Interests

Digital signal and image processing • Computational Optics • Time-of-Flight

Education

Michigan Technological University **Houghton, MI**
PhD, Electrical Engineering *2012–2016*

Advisor: Dr. D. Fuhrmann

Dissertation: Hybrid MIMO Phased Array Radar Receive Signal Processing

Relevant courses: Optimum Array Processing, Detection and Estimation Theory, Information Theory, Introduction to Algorithms, College Teaching

University of Pisa **Pisa, Italy**
MS, Telecommunication Engineering *2008–2011*

Advisors: Dr. M. S. Greco, Dr. F. Gini, Dr. D. Fuhrmann

Thesis: Adaptive Sensing in Distributed MIMO Radars

University of Pisa **Pisa, Italy**
BS, Telecommunication Engineering *2005–2008*

Thesis: Convergence Time Performance Analysis of RIP and OSPF Routing Protocols in a Network of Juniper Routers

Research Experience

University of Wisconsin – Madison **Madison, WI**
Postdoctoral Research Associate *2016–Present*

- **Project:** REVEAL – Revolutionary Enhancement of Visibility by Exploiting Active Light-fields (funded by DARPA – Defense Advanced Research Projects Agency)
  - Assembled and tested an experimental setup to capture data for a Non-Line-of-Sight (NLOS) imaging scenario
  - Assembled and tested a controlled experiment to capture data for a NLOS tracking scenario
  - Designed and implemented in MATLAB two iterative backprojection-based algorithms for NLOS imaging that provide performance improvements over the state-of-the-art
  - Mentored and supervised undergraduate and graduate students in the realization of simulations and experiments
  - Organized the Git repository for the programming scripts relative to this project
- **Project:** Lake Tomography – Fast 3D Mapping of Harmful Algal Blooms (HAB) Development and Distribution in Wisconsin Lakes (currently unfunded)

- Engineered a fast and cost-efficient computational imaging system capable of 3D mapping of microorganisms in lakes that frequently experience harmful algal blooms (HABs)
- Developed a research proposal, including the budget
- Mentored and supervised undergraduate and graduate students in the realization of simulations and experiments

Michigan Technological University **Houghton, MI**
Graduate Research Assistant *2012–2016*

- **Project:** Hybrid MIMO Phased Array Radar (HMPAR) Receive Signal Processing (*PhD Dissertation*)
  - Conducted background literature review on HMPAR
  - Derived analytically the Cramer-Rao Lower Bounds (CRLB) for the HMPAR
  - Evaluated the HMPAR CRLB and compared them to state-of-the art through MATLAB simulations
- **Project:** An Active Divide-and-Conquer Algorithm for Sparse Support Recovery
  - Conducted background literature review on Compressed Sensing
  - Implemented in MATLAB a novel algorithm for sparse support recovery, based on a divide and conquer approach

Michigan Technological University **Houghton, MI**
Visiting Scholar (MS Researcher) *2011*

- **Project:** Adaptive Sensing in Distributed MIMO Radars (*MS Thesis*)
  - Conducted background literature review on MIMO radars
  - Implemented a novel algorithm for target localization in a 2-D discrete space
  - Evaluated algorithm performance through MATLAB simulations

Microwave Systems Class **University of Pisa**
MS Student, Pisa, Italy *Spring 2010*

- EMvironment Project
  - Designed a scenario that included a mobile antenna tower, apartment complexes, commercial buildings, and open spaces
  - Evaluated the electromagnetic fields produced by the mobile antenna tower inside an apartment

Microwave Systems Class **University of Pisa**
MS Student, Pisa, Italy *Spring 2010*

- Ansoft Designer Project
  - Designed a GPS antenna described in a research paper provided by the instructor
  - Compared results with the ones in the research paper
  - Investigated antenna performance results, if antenna parameters were changed

BS Thesis **University of Pisa**
BS Student, Pisa, Italy *Summer 2008*

- Convergence Time Performance Analysis of RIP and OSPF Routing Protocols in a Network of Juniper Routers
  - Constructed a virtual network of Juniper routers using virtual machines on a commercial PC
  - Analyzed the convergence time of the RIP and OSPF routing protocols while simulating a node failure in the network

Skills

Computer: MATLAB, C++, HTML, LabVIEW, Microsoft Windows, Excel, PowerPoint, LaTeX, Mac, Windows, Linux

Hardware: Class 4 fs/ps-pulsed lasers, time-of-flight cameras, time-correlated single photon counting (TCSPC), optical components, electronic test instruments

Technical: Radar systems, optical systems; detection and estimation theory

Publications

Journal

S. A. Reza, **M. La Manna**, and A. Velten, "A Physical Light Transport Model for Non-Line-of-Sight Imaging Applications", (submitted), Pre-print: `https://arxiv.org/abs/1802.01823`

M. La Manna, et al., "Error Backprojection Algorithms for Non-Line-of-Sight Imaging", (submitted), Pre-print: `https://minds.wisconsin.edu/handle/1793/77851`

M. La Manna, D. Fuhrmann, "Cramér–Rao Lower Bound Comparison for 2D Hybrid-MIMO and MIMO Radar", *IEEE J. Sel. Topics Signal Proc.*, vol. 11, no. 2, pp. 404 - 413, Mar. 2017

Conference

M. [Mario] La Manna, **M. [Marco] La Manna** "Cognitive Radar Waveforms for Frequency Dense Environments", *2017 IEEE Radar Conf. (RadarConf)*, Seattle, WA, 2017, pp. 1603-1607

M. La Manna, D. Fuhrmann, "Target Location Estimation Performance Evaluation for a 2D Hybrid-MIMO Radar", *2017 IEEE Radar Conf. (RadarConf)*, Seattle, WA, 2017, pp. 591-595

M. La Manna, D. Fuhrmann, "Hybrid-MIMO and Phased Array Radar Receive Signal Processing", *2016 IEEE Radar Conf.*, Philadelphia, PA, May 2016, pp. 1-4

M. La Manna, D. Fuhrmann, "An Active Divide-and-Conquer Algorithm for Sparse Recovery Support: Fluctuating Target Case", *IEEE 3rd Int. Workshop Compressed Sens. Theory Applicat. Radar Sonars and Remote Sens.*, June 2015, pp. 194-198

Communication Skills

Aug. 2017: Oral presentation at the 2017 SPIE Optics & Photonics - Wavelets and Sparsity XVII Conference (San Diego, CA)

May 2017: Oral presentation at the 2017 IEEE Radar Conference (Seattle, WA)

May 2016: Oral presentation at the 2016 IEEE Radar Conference (Philadelphia, PA)

Apr. 2016: Oral co-presentation at the Midwestern Association of Graduate Schools (MAGS) 72nd Annual Meeting (Chicago, IL)

June 2015: Poster at the 2015 CoSeRa Workshop (Pisa, Italy)

Leadership Experience

Michigan Technological University

2014–2015: **Vice-President**, Graduate Student Government

2014–2015: **Co-Chair**, Student Commission

2014–2015: **Member**, Student Health Insurance Advisory Committee

2013–2014: **Public Relations Chair**, Graduate Student Government

2013–2014: **Member**, College of Engineering Dean Search Committee

2012–2013: **Department Representative**, Graduate Student Government

2012–2013: **Member**, Teaching Assistant Stipend Review Committee

Teaching Experience

Michigan Technological University **Houghton, MI**
Graduate Teaching Assistant *2013–2014*

- Circuits and Instrumentation, Undergraduate class (20 hours/week)
  - Guided and supervised the class (15-20 students) in the creation of physical and simulated circuits in a laboratory environment
  - Graded homework and laboratory assignments
  - Held weekly office hours

Honors and Awards

May 2016: Student Travel Grant, 2016 IEEE Radar Conference

2014–2016: Dave House Graduate Research Fellowship

Spring 2015: Eta Kappa Nu, Beta Gamma Chapter, IEEE Honors Society

Spring 2014: Jonathan Bara Award, Outstanding Graduate Teaching Assistant

Fall 2012: Certificate of Merit, Linear Algebra

Professional Service

2016–Present: Reviewer for Multidisciplinary Digital Publishing Institute (MDPI) Entropy, Multidisciplinary Digital Publishing Institute (MDPI) Sensors, Elsevier Digital Signal Processing, IEEE Radar Conference, IEEE Transactions on Aerospace and Electronic Systems

Affiliations

2017–Present: Member, SPIE (The International Society for Optics and Photonics)

2017–Present: Member, OSA (The Optical Society)

2013–Present: Member, IEEE (Institute of Electrical and Electronic Engineers)

Volunteering

Apr. 2016: Judge at the Michigan Tech Undergraduate Expo

Apr. 2014: Judge at the Michigan Tech Undergraduate Expo

Enterprise and Senior Design teams showcase their hands-on work, based on real industrial problems. Judges are needed to critique the projects.

Languages

Italian: Mothertongue

English: Fluent

Spanish: Basic