F. ANTONIO MEDRANO

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https://antoniomedrano.github.io

EDUCATION

Doctor of Philosophy, University of California, Santa Barbara (UCSB) — December 2014
Geography, emphasis in Modeling, Measurement and Computation

Master of Science, University of California, Santa Barbara (UCSB) — March 2009
Media Arts and Technology, emphasis in Multimedia Engineering

Bachelor of Science, Harvey Mudd College, Claremont, CA — May 2002
Engineering (with honors), emphasis on Systems Simulation and Modeling

ACADEMIC EMPLOYMENT

Post-Doctoral Researcher, University of California, Santa Barbara, CA (April 2015 – January 2016)

Visiting Professor, Universitat Jaume I, Castellón, Spain (Sept.–Oct. 2015): *Geographic Information Systems*

Instructor, University of California, Santa Barbara (W11, S13): *Intro. to Optimization for Geographic Problems*

Instructor, University of California, Santa Barbara (Summer 13): *Maps and Spatial Reasoning (online course)*

Instructor, University of California, Santa Barbara (W06, W07, W08): *Mathematics for Digital Signal Processing*

Graduate Student Researcher and Teaching Assistant, University of California, Santa Barbara (20+ quarters)

ACADEMIC RESEARCH

Post-Doctoral Research – Studied the role of libraries in the archiving, search, and discovery of digital spatial information, particularly with open repositories for spatial research data. Supervised a master's and an undergraduate student on developing a software prototype for linked data systems for online spatial data repositories, leading to a peer reviewed publication on the topic.

PhD Thesis – Develop path-routing algorithms that incorporate parallel computing for use on big data sets, in order to generate spatially diverse and non-inferior minimum cost path alternatives over terrain raster GIS networks. Research applications included GIS tools for planning new transmission corridors; where designers require the ability to generate numerous viable options that are spatially divergent, yet minimize various objectives.

M.S. Project – Designed, prototyped, and tested an optical position sensor for a subwoofer loudspeaker, and incorporated the sensor into an analog feedback controller in order to reduce the harmonic distortion from the speaker. Developed in partnership with Music Reference (www.ramlabs-musicreference.com).

REFEREED ARTICLES AND BOOK CHAPTERS

- 2016, Lafia, S., J. Jablonski, W. Kuhn, S. Cooley, F.A. Medrano, Spatial discovery and the research library. *Transactions in GIS*, 20: 399–412.
- 2015, Medrano, F.A., R.L. Church. A parallel computing framework for finding the supported solutions to a biobjective network optimization problem. *Journal of Multi-Criteria Decision Analysis*, 22: 244-259.
- 2014, Medrano, F.A. *Corridor Location: Generating Competitive and Efficient Route Alternatives*. Ph.D. Dissertation, Geography, University of California at Santa Barbara.
- 2014, Scaparra, M.P., R.L. Church, F.A. Medrano. Corridor location: The multi-gateway shortest path model. *Journal of Geographical Systems* 16, 287-309.
- 2014, Medrano, F.A., R.L. Church. Corridor location for infrastructure development: A fast bi-objective shortest path method for approximating the Pareto frontier. *International Regional Science Review* 37, 129-148.
- 2013, Medrano, F.A., R.L. Church. A parallel algorithm to solve near-shortest path problems on raster graphs. in *Modern Accelerator Technologies for Geographic Information Science.* Springer US, 83-94.
- 2009, Medrano, F.A., *Optical Position Sensors with Applications in Servo Feedback Subwoofer Control*. M.S. Thesis, Media Arts and Technology Program, University of California at Santa Barbara.

PROFESSIONAL EXPERIENCE *(reverse chronological)*

Co-Founder and Algorithm Engineer, Arogi Inc, Santa Barbara, CA (February 2016 – January 2017)
Integrated open-source software to create a spatial optimization platform for solving location, transportation, and logistics problems. Led back-end of product development using Google OR-Tools for spatial optimization models, including developing advanced proprietary heuristic methods. Managed company finances and payroll. Involved in customer discovery, report writing, and all sorts of other details that come with being a founder. Funded by NSF-SBIR #1549445, $149,905.

Test Engineering Intern, Superconductor Technologies, Santa Barbara, CA (Summer 2006)
Designed and implemented a testing station and circuit board for quality control testing of a new product. Wrote all associated test procedures. Re-wrote test procedures for existing products to optimize efficiency. Trained interns in performing tests and machine shop use. Mentored interns on other product testing projects.

Quality Engineering Intern, Superconductor Technologies, Santa Barbara, CA (June 2005–December 2005)
Improved reliability engineering test configurations to increase capacity and ease of setup. Improved fixturing and procedures for product failure analysis, augmenting diagnostics of many previously unresolved flaws. Trained suppliers on new testing procedures. Designed and machined custom fixtures for quality testing setups.

Project Manager, CTG Energetics (bought by Cadmus Group in 2012), Irvine, CA (June 2002–August 2003)
Consultant for energy efficiency and sustainability of buildings. Assisted architects, building engineers, and contractors with their designs to make them more environmentally friendly, including consulting for LEED Green Building certification. Programmed DOE2 computer simulations for energy efficiency analysis, performed on-site energy audits and building commissioning.

Summer Engineering Intern, Opto22, Temecula, CA (Summer 2001)
Redesigned Ethernet controller to reduce the number of chips on the PCB. Redesigned industrial controller from through-hole electrical components to all surface-mount chips. This included finding compatible chips, new PCB layout, performing signal integrity simulations, and implementing final production procedures. Designed and prototyped a low-cost injection mold 35mm DIN clip.

Engineering Research Intern, Dept. of Civil and Environmental Engr., Univ. of California, Davis (Summer 2000)
Designed and constructed an electrical device do display a warning light when a driver's driving habits increase pollution, and interfaced the device with a data acquisition system to monitor the driver's style. Ran preliminary experimental trials to determine behavioral changes in response to the warning light.

Engineering Research Intern, Institute of Transportation Studies, Univ. of California, Davis (Summer 1999)
Formulated a scientific study of roadside particulate emissions from gasoline and diesel vehicles. Repaired two Active Scanning Aerosol Spectrometers used in the study. Instructed other students who continued the study.

SKILLS

Computer: Proficient on Windows / Mac / Linux computers and productivity software
Proficient in Java, Python, Swift, MATLAB; knowledge of C, C++, MPI, CILK++, KML, and HTML
Please see my Github page for code samples and activity: https://github.com/antoniomedrano
Experienced using FICO Xpress, LINGO, ArcGIS, Google Earth, Google OR-Tools

Foreign Languages: Proficient in Spanish (speak/read/simple written), knowledge of French (speak/simple read)

Other skills: Public speaking (TEDx talk: https://tedxsantabarbara.com/2016/antonio-medrano/), machining (metal, plastic, wood), electronic circuits and soldering

AWARDS, FELLOWSHIPS, AND OUTSIDE INTERESTS

- Eagle Scout Rank, Boy Scouts of America, including many leadership positions
- Tau Beta Pi engineering honor society, Omega chapter, member
- State of California, Engineer in Training, # EIT115948
- 2010-2011 University of California Transportation Center Graduate Fellowship recipient
- 1999-2000 University of California Transportation Center Summer Undergraduate Fellowship recipient
- California Non-Residential Title 24-2001 Certified Energy Plans Examiner
- Former member of professional a cappella group The House Jacks (2006–2010)
- Other interests: Singing (bass voice), cooking, tennis, automotive enthusiast, handyman, foodie, gardening

For additional information including a list of research reports and invited conference talks and presentations, please refer to my website at: https://antoniomedrano.github.io/