Robert Baraldi

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Areas of specialization

Optimization • Inverse Problems • Nonsmooth • Nonconvex • Trust Regions • PDE-constrained • Uncertainty Quantification

Education

In progress PhD in Applied Mathematics, University of Washington. **PhD Advisor**: Aleksandr Aravkin.
2017 MSc in Applied Mathematics, University of Washington
2016 BS in Mathematics, NC State University. **Academic Advisor:** Alina Duca. **Research Advisor:** Harvey Thomas Banks.

Research Experience

Graduate

2018- Lawrence Berkeley National DOE CSGF Lab Practicum: Reduced Order Models and Implicit Sampling
2017-2018 Basis Pursuit Denoise with Nonsmooth Constraints
2016-2018 Relaxation Algorithms for Matrix Completion, with Applications to Seismic Travel-time Data Interpolation.

Undergraduate

2013-2016 Student Researcher, Center for Research in Scientific Computation, NC State University
2015 Undergraduate Researcher, Cold Spring Harbor Labs
2014, 2016 Summer Student Worker, Pfizer Inc.

Grants, honors & awards

Graduate

2017 Department of Energy Computational Science Graduate Fellowship (DOE CSGF)
2017 National Science Foundation Graduate Research Fellowship (NSF-GFRP, declined)
2016 Department of Applied Math Boeing Fellowship/Top Scholar Award, UW

Undergraduate

2014 Mathematical Honors Program
2013 Business and Finance Scholarship
2012 University Honors Program
2012 Goodnight Scholarship
2012 SECU Foundation Scholarship
2012-2016 Dean's List

Teaching

2016 Teaching Assistant: MATH 126 Calculus 3, University of Washington
2013 Mathematics Tutor: MA 121 Calculus 1, MA 241 Calculus 2, NC State University

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Publications & talks

Journal articles

2018 Robert Baraldi, Rajiv Kumar, Aleksandr Aravkin (2018), "Basis Pursuit Denoise with Nonsmooth Constraints", *IEEE Signal Processing* (under revision - preprint available)

2018a Robert Baraldi, Carl Ulberg, Rajiv Kumar, Kenneth Creager, Aleksandr Aravkin (2018), "Relaxation Algorithms for matrix completion, with applications to seismic travel-time data interpolation", *Inverse Problems* (to appear late 2019 - preprint available).

2016a Harvey Thomas Banks, Robert Baraldi, Jared Catenacci, Nicholas Myers (2016), "Parameter Estimation Using Unidentified Individual Data in Individual Based Models". *Mathematical Modeling of Natural Phenomena* 11(6):103-121.

2016b Harvey Thomas Banks, Robert Baraldi, Kevin Flores, Michael Stemkovski (2016), "Validation of a Mathematical Model for Green Algae (*Raphidocelis subcapitata*) Growth and Implications for a Coupled Dynamical System with *Daphnia Magna*", *Applied Sciences* 6(5): 155.

2015a Kaska Adoteye, Harvey Thomas Banks, Robert Baraldi, John Nardini, W Clay Thompson (2015), "Correlation of Parameter Estimators for Models Admitting Multiple Parametrizations", *International Journal of Pure and Applied Mathematics* 105(3): 497-522.

2015b Harvey Thomas Banks, Robert Baraldi, Kevin Flores (2015), "Optimal Design for Minimizing Uncertainty in Dynamic Equilibrium Systems", *Eurasian Journal of Mathematical and Computer Applications* 3: 20-43.

2015c Harvey Thomas Banks, Robert Baraldi, Karissa Cross, Christina McChesney, Laura Poag, Emma Thorpe, Kevin Flores (2015), "Uncertainty quantification in modeling HIV viral mechanics.", *Mathematical Biosciences and Engineering* 12(5): 937-964

Conference Proceedings

2014 Robert Baraldi, Karissa Cross, Christina McChesney, Laura Poag, Emma Thorpe, Kevin Flores, Harvey Thomas Banks (2014) Uncertainty quantification for a model of HIV-1 patient response to antiretroviral therapy interruptions. *Proceedings of the 2014 American Control Conference*, 2753-2758

Conference Presentations

2016 "Systems Modeling and Data Assimilation in Drug Development", SIAM Annual Life Sciences Conference, Boston, MA, July 11-15, 2016.

Technical Reports

2014 Robert Baraldi, John Nardini, Emma Thorpe, and Harvey Thomas Banks (2014) The Effects of Parameterization on Inverse Problems, CRSC Technical report CRSC-TR14-07, Raleigh, NC.

2013 Robert Baraldi, Karissa Cross, Christina McChesney, Laura Poag, Emma Thorpe, Kevin Flores, and Harvey Thomas Banks (2013) "Mathematical Modeling of HCV Viral Kinetics". CRSC Technical report CRSC-TR13-07, Raleigh, NC.