**CLANCY, RICHARD J**

## EDUCATION

University of Colorado – Boulder, CO
**PhD Applied Mathematics – expected May 2022** **Aug 2017 – Present**
Focus on methods to handle uncertain/misspecified forward models for inverse problems and associated algorithms. Methods studied include robust optimization and approximative MLEs for general noise models. Applications in blind source separation, signal processing, and localization in MEG for brain-computer interfacing.
Advisor: Stephen Becker

Texas State University – San Marcos, TX
**MS Applied Mathematics** **May 2017**
Studied truncation error for numerical PDEs over irregular, non-uniform meshes
Thesis: "Numerical solutions to Poisson's equation over non-uniform discretizations with associated fast solvers"

University of Colorado – Boulder, CO
**BA Physics** **May 2007**

## RESEARCH, TEACHING, AND PROFESSIONAL EXPERIENCE

University of Colorado – Boulder, CO
**Teaching Assistant** **Aug 2017 – Present**
Courses taught include Calculus 2, Calculus 3, Differential Equations, and Linear Algebra, Markov Processes.

Los Alamos National Laboratory – Los Alamos, NM (remote)
**Research Intern** **July 2021 – September 2021**
Investigated likelihood and remedial actions for rounding error in scientific computing pipelines

Argonne National Laboratory – Lemont, IL (remote)
**Givens Associate** **May 2021 – July 2021**
Studied and implemented trust region method exploiting mixed precision computations for large scale scientific computing and "big data" applications

FieldLine, Inc – Boulder, CO
**Summer Research Intern** **May 2020 – Aug 2020**
Developed anomaly detection software for military/border security applications using magnetometers. Modeled different sensor array geometries to determine optimal configurations for counter-tunneling.

Sensory, Inc – Boulder, CO
**Summer Research Intern** **May 2019 – Aug 2019**
Member of vision research team investigating methods for solving non-linear least squares problems to estimate pose angles and absolute distance from a camera. Contributed to production code employed on mobile devices for facial authentication. Wrote scripts to parse/analyze large and messy datasets. Debugged inhouse legacy C++ code.

Texas State University – San Marcos, TX
**Research Assistant / Teaching Assistant** **Aug 2015 – May 2017**
Studied numerical methods for solving PDEs with a focus on error analysis of non-uniform discretizations within the finite difference framework. Developed fast-solvers based on the multigrid method.

Bluewater Financial Advisors, LLC. – Austin, TX
**Risk Manager** **Oct 2014 – Aug 2015**
Oversaw company-wide derivative exposure, ensuring positions remained within prescribed risk limits. Modeled scenario pricing to optimize option trading strategies on energy futures.

AAA Capital Management Advisors, LTD. – Houston/Austin, TX
**Quantitative Analyst / Natural Gas Options Trader** **Jul 2007 – Sep 2014**
Conducted fundamental and quantitative research at energy focused commodity trading advisor. Assisted in the development of a proprietary risk-management system that evaluated derivative option risks in real-time. Developed and implemented automation routines for collecting large amounts of data. Built economic models and conducted numerical experiments. Ultimately managed a $25 million discretionary option portfolio focused on natural gas.

## PAPERS AND MANUSCIPTS

*"Robust least squares for quantized data matrices"*
with Stephen Becker. *Signal Processing 176, 107711*

*"A study of optically-pumped magnetometers for use in magnetoencephalography without shielding "*
with Vladislav Gerginov, Svenja Knappe, Stephen Becker, Orang Alem *Physics in Biology and Medicine 66, 175030*

*"Approximate maximum likelihood estimators for linear regression with design matrix uncertainty"*
with Stephen Becker. Submitted to *IEEE Transactions on Signal Processing*

*"Numerical solutions to Poisson's equation over non-uniform discretizations with associated fast solvers "*
completed under the direction of Young Ju Lee MS thesis

## PRESENTATIONS

*"Design matrix uncertainty: robust optimization and approximate MLE approaches"*
SIAM Conference in Optimization, July 2021, Spokane, WA (remote)

*"Approximate maximum likelihood estimators for linear regression with design matrix uncertainty"*
SIAM Front Range Student Conference, March 2021, Denver, CO (remote)

*"Optimal Convergence of the Shortley-Weller Formula for Poisson's Equation over an Interior Non-Uniform Grid"*
Diff. Equations and Applied Math Seminar, May 2017, Texas State University – San Marcos, TX

## GRANTS AND AWARDS

Texas State University Thesis Research Support Fellowship – $2,000.00 **Aug 2016**

## SERVICE

SIAM CU Graduate Student Chapter, Boulder, CO
**President** **Spring 2020 – Present**
Coordinate and plan SIAM related activities, organize talks, and oversee operations.

ICML 2021
**Reviewer** **Spring 2021**
Evaluated submissions for acceptance at the conference

SIAM Front Range Student Conference, Denver, CO (remote)
**Organizer** **Spring 2021**
Helped organize and schedule a student run conference for university students in the region to share their research or present on a topic of interest.

Summer Stem Camp on Data Science and Machine Learning – Longmont, CO and Aurora, CO
**Educator** **Summer 2018 and 2019**
Volunteered to teach mini-course intended to excite middle and high school students about research/careers in data science and machine learning.

MTY Academy – Austin, TX
**Educator** **Summer 2016 and 2017**
Taught local middle school students geometry as part of summer enrichment program.

## COMPUTER LITERACY

Extensive coding experience with MATLAB, Python, and Visual Basic for Applications.
Comfortable working from Linux/Unix command line with some parallel computing experience.
Classroom experience with C++ and R.