Colin P. Roberts

Fort Collins, CO

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PROFESSIONAL SUMMARY

Mathematical physicist with a diverse background interested in developing novel computational methods for models that incorporate real world data. I am eager to explore new content and improve my technical skills and collaborative abilities in order to solve challenging problems.

RELEVANT SKILLS

Applied math: Data assimilation, dimension reduction, principal component analysis, differential equations, tensor algebra, geometric algebra, discrete differential geometry, Gaussian mixture models, multiscale modeling
Communication: Teaching, delegation, research presentations, technical writing, remote collaboration
Programming and software: Python, Matlab, Java, Git, LaTeX, Linux, SQL
Packages: Parallel computing toolbox, Numpy, Pandas, Matplotlib, TensorFlow

RELEVANT EXPERIENCE

Graduate Student | Collaboration, Research, and Teaching   **08/2017 – Present**
Colorado State University, Fort Collins, CO
- **Thesis:** Using Clifford Analysis to Study Inverse Tomography
- Solo author of *A Gelfand Transform for Spinor Fields on Embedded Riemannian Manifolds.* [Preprint]

Ongoing collaboration in Data Assimilation
- Developing proprietary modular code base for projected particle filter algorithm. [Github]
- Optimizing algorithm performance through on-line dimension reduction while adding capability to probe for non-Gaussian behavior using time-varying Gaussian mixture models.

Ongoing collaboration with NASA
- Collaborating with experts in electromagnetics and plasmas to continue work on the Maxwell–Vlasov equation.

Teaching Background
- Taught 7 different courses over 10 semesters and developed the content of 4 courses. [Materials]
- Developed an open-source textbook and Matlab tools for an applied mathematics for chemists course. [Github]

NASA: Internship Program | Topological Plasmas   **06/2021 – 08/2021**
NASA Glenn Research Center, Cleveland, OH (Remote)
- Worked with collaborators to develop a geometric framework for the Maxwell-Vlasov equation for plasmas.

AIM: Summer Program on COVID-19 Modeling | Multiscale Modeling   **06/2020 – 07/2020**
American Institute of Mathematics, San Jose, CA (Remote)
- Developed a multiscale epidemic model that incorporated real world data to predict the spread of COVID-19 in communities with schools.
- Presented our group's work and interviewed with American Institute of Mathematics. [Link]
- Provided our codebase and insight to JBS Foods in Greeley, CO. [Github]

AIM: Engagement Program with MCRN | Data Assimilation   **07/2019 – Present**
Raleigh, NC & Remote
- Worked collaboratively to develop novel data assimilation software for high-dimensional nonlinear systems and presented this work at numerous conferences. [Publication]

EDUCATION

Colorado State University, Fort Collins, CO, USA   **08/2012 – Present**
Doctor of Philosophy, Mathematics   *Expected June 2022*
Bachelor of Science, Honors Student in Mathematics & Physics   *May 2017*

HOBBIES

I am an avid hiker, trail runner, and mountain biker. I also aspire to be a better chef, baker, and equity trader.