COLIN P. ROBERTS

Fort Collins, CO

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PROFESSIONAL SUMMARY

Mathematical physicist with a diverse background interested in using geometric, topological, algebraic, and analytic tools to build 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
- Author of *A Gelfand Transform for Spinor Fields on Embedded Riemannian Manifolds.* [Preprint]

Ongoing collaboration with NASA
- Networking with experts in the field of topological electromagnetism.
- Writing multiple papers on the use of Clifford algebras in topology and the role of topological measurements in electromagnetism to continue the geometric approach to the Vlasov equation.

Ongoing collaboration in Data Assimilation
- Developing proprietary code base for ocean-atmosphere analyses to explore the coupling between the sea and atmosphere. [Github]
- Optimizing algorithm performance while adding capability to probe for non-Gaussian behavior.

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 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.