Jack Coughlin

Department of Applied Mathematics, University of Washington
(206) 245-0838 • johnbc@uw.edu

Education

Ph.D. in Applied Mathematics
University of Washington <div align="right">*2019–Present*</div>

Advised by:
Professor Jingwei Hu <div align="right">Applied Mathematics</div>
Professor Uri Shumlak <div align="right">Aerospace and Energetics Research Program</div>

- My research is focused on fast algorithms for kinetic equations of plasma dynamics, in particular dynamical low-rank methods.

B.S. in Mathematics
University of Washington <div align="right">*2008–2013*</div>

Publications

[1] COUGHLIN, J., AND HU, J. Efficient dynamical low-rank approximation for the Vlasov-Ampère-Fokker-Planck system. *Journal of Computational Physics* (Sept. 2022), 111590 [DOI] [arXiv]

[2] COUGHLIN, J., AND PERRONE, G. Multi-scale Anomaly Detection with Wavelets. In *Proceedings of the International Conference on Big Data and Internet of Thing - BDIOT2017* (London, United Kingdom, 2017), ACM Press, pp. 102–108

Talks and Posters

[3] *Low-rank decomposition of plasma kinetic distributions in the collisional transition regime*. Poster at IEEE ICOPS, May 2022. [abstract]

[4] *Asymptotic-preserving dynamical low-rank discretization of kinetic plasma models*. Presentation at Isaac Newton Institute, March 2022. [slides]

[5] *A Data-Driven Analysis of Non-Equilibrium Transport in the Magnetized Kelvin-Helmholtz Instability*. Poster at APS DPP 2021. [abstract]

Industry Experience

Systems Administrator, Applied Mathematics Department
University of Washington <div align="right">*2021*</div>

Senior Software Engineer
Square, Inc. <div align="right">*2013–2016, 2018–2019*</div>

Member of Technical Staff
Inscriptive, Inc. <div align="right">*2016–2018*</div>

Patents

[6] PERRONE, G., LEDUC, M., COUGHLIN, J., AND KUMAR, A. Determining recommendations from buyer information, Sept. 2017. US Patent 9,767,471

Teaching Experience

Teaching Assistant, AMATH 301 Beginning Scientific Computing
University of Washington   *Fall 2020*

Service

Graduate Student Representative, UW Applied Mathematics Department
                                                               2022–present

Secretary, UW SIAM Student Chapter
                                                               2021–2022

Awards and Scholarships

Honorable Mention, National Science Foundation Graduate Research Fellowship Program (2021)

University of Washington Robinson Center Paradise Scholarship (2011)

University of Washington Global Opportunities Fritz Scholarship (2011)

Programming Language Proficiencies

Scientific: Julia, MATLAB, Mathematica, R

General purpose: Rust, Java, Python, Javascript, C++

Membership in Professional Societies

Member of SIAM (Society for Industrial and Applied Mathematics)