Hans Riess

Mathematical Engineer

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EDUCATION

Doctor of Philosophy   2022
University of Pennsylvania
Electrical and Systems Engineering
Thesis: Lattice Theory in Multi-Agent Systems • Advisor: Robert Ghrist

Bachelor of Science   2017
Duke University
Mathematics

PUBLICATIONS

Journal Article

- Claudio Battiloro, Zhiyang Wang, Hans Riess, Paolo Di Lorenzo, Alejandro Ribeiro.
  Tangent bundle convolutional learning: from manifolds to cellular sheaves and back.
  IEEE Transactions on Signal Processing, Vol. 72, pp. 1892-1909, 2024   [URL]

- Robert Ghrist, Hans Riess.
  Cellular sheaves of lattices and the Tarski Laplacian.
  Homology, Homotopy and Applications, Vol. 24, Issue 1, pp. 325-345, 2022   [DOI] [URL]
  (Authors listed alphabetically)

- Michael Catanzaro, Justin Curry, Brittany Fasy, Jānis Lazovskis, Greg Malen, Hans Riess, Bei Wang, Matthew Zabka.
  Moduli spaces of Morse functions for persistence.
  Journal of Applied and Computational Topology, Vol. 4, Issue 3, pp. 335-385, 2020   [URL]
  (Authors listed alphabetically)

Conference Proceedings

- Tyler Hanks, Hans Riess, Samuel Cohen, Trevor Gross, Hatthew Hale, James Fairbanks.
  Distributed multi-agent coordination over cellular sheaves.
  2025 IEEE 64th Conference on Decision and Control (to appear), 2025   [URL]

- Xenia Konti, Hans Riess, Manos Giannopoulos, Yi Shen, Michael Pencina, Nicoleta Economou-Zavlanos, Michael Zavlanos.
  Distributionally robust clustered federated learning: a case study in healthcare.
  2024 IEEE 63rd Conference on Decision and Control (CDC), pp. 4164-4172, 2024   [URL]

- Hans Riess, Gergory Henselman-Petrusek, Michael Munger, Robert Ghrist, Zachary Bell, Michael Zavlanos.
  Network preference dynamics using lattice theory.
  2024 American Control Conference, pp. 2802-2808, 2024   [URL]

- Hans Riess, Michael Munger, Michael Zavlanos.
  Max-plus synchronization in decentralized trading systems.
  2023 62nd IEEE Conference on Decision and Control (CDC), pp. 221-227, 2023   [URL]

- Claudio Battiloro, Zhiyang Wang, Hans Riess, Paolo Di Lorenzo, Alejandro Ribeiro.
  Tangent bundle filters and neural networks: from manifolds to cellular sheaves and back.
  2023 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2023   [URL]

- Mikhail Hayhoe, Hans Riess, Michael Zavlanos, Victor Preciado, Alejandro Ribeiro.
  Transferable hypergraph neural networks via spectral similarity.
  The Second Learning on Graphs Conference, 2023   [URL]

- Hans Riess, Robert Ghrist.
  Diffusion of information on networked lattices by gossip.
  2022 IEEE 61st Conference on Decision and Control (CDC), pp. 5946-5952, 2022   [URL]

- Hans Riess, Yiannis Kantaros, George Pappas, Robert Ghrist.
  A temporal logic-based hierarchial network connectivity controller.
  SIAM Conference on Control and its Applications, pp. 17-24, 2021   [URL]

- Hans Riess, Jakob Hansen, Robert Ghrist.
  Multidimensional persistence module classification via lattice-theoretic convolutions.
  NeurIPS Topological Data Analysis and Beyond Workshop, 2020   [URL]

Preprint

- Robert Ghrist, Miguel Lopez, Paige Randall North, Hans Riess.
  Categorical diffusion of weighted lattices.
  2025   [URL]
  (Authors listed alphabetically)

- Hans Riess, Manolis Veveakis, Michael Zavlanos.
  Path signature and graph neural networks for slow earthquake analysis: better together?.
  arXiv, 2024   [URL]

- Alejandro Parada-Mayorga, Hans Riess, Robert Ghrist, Alejandro Ribeiro.
  Quiver signal processing.
  arXiv:2010.11525, 2020   [URL]

Thesis

- Hans Riess.
  Lattice theory in multi-agent systems.
  University of Pennsylvania, 2022   [URL]