

Erik Weis

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EDUCATION

University of Vermont

Burlington VT

M.S. in Complex Systems and Data Science

2023

- Thesis: *Robust Interventions in Network Epidemiology*.
- * Advisors: Prof. Jean-Gabriel Young, Prof. Laurent Hébert-Dufresne.

Dartmouth College

Hanover, NH

B.A. in Physics

2018

- Thesis: *Benchmarking Quantum Computers Using Electronic Structure Algorithms*.
- * Advisor: Prof. James D. Whitfield.

EXPERIENCE

Northeastern University, Network Science Institute

Oct. 2023 – Present

Research Assistant, Complexity & Society Lab

Boston, MA

- Conducting network science research related to coarse-graining networks, network reconstruction from dynamical data, and generative network models.
- Contributing to a collabathon project to consolidate and evaluate the range of existing methods for coarse-graining networks at the Summit for the Future of Multilayer Network Science in Zaragoza, Spain.

University of Vermont, Complex Systems Center

Sept. 2021 – Oct. 2023

Graduate Research Assistant, Joint Lab

Burlington, VT

- Conducted original research at the intersection of complex networks, Bayesian inference, and statistical physics.
- Accepted talk “Decision-making in uncertain networks via dynamic importance” at NetSci 2023.
- Developed Bayesian framework for designing interventions in spreading dynamics under structural and dynamical uncertainty.
- Developed message passing methods for testing heterogeneous, temporal interventions for disease prevention.
- Explored the relationship between optimal interventions for three common and distinct objectives in epidemiology: vaccination, disease surveillance, and influence of opinions.
- Organized weekly SCRAPS graduate student seminar.

qBraid

Jun. 2020 – Apr. 2022

Quantum Software Engineer

Fort Lauderdale, FL

- Lead team of 8 people in the development of an industry-grade software development kit for interfacing with quantum computers.
- Developed a MOOC-style introductory course on quantum computing, endorsed by White House Quantum Computing Task Force.
- Taught introductory course to 300+ high school and college students.

Fort Lauderdale High School

Oct. 2018 – Jun. 2019

Instructor in Math, Physics, Music

Fort Lauderdale, FL

- Taught Algebra II, Physics Honors, and Financial Algebra classes to grades 9-12.
- Started and led the school’s first choir program; conducted after-school rehearsals twice per week.

Dartmouth College

Aug. 2017 – Jun. 2018

Undergraduate Research Assistant

Hanover, NH

- Explored the application of quantum computers to molecular structure simulation.
- Simulated electronic structure of hydrogen using two quantum computers from IBM Research and Rigetti.

PREPRINTS, PUBLICATIONS, AND WORKING PAPERS

- **Weis, E.**, Hébert-Dufresne, L., & Young, J-G. (to be submitted, *Nature Communications*). “Evaluating node importance in the face of model errors.”

CONFERENCES & WORKSHOPS

- **Complex Networks Winter Workshop**; Québec City, Canada; Dec. 2023.
- **International Conference on Complex Networks & their Applications**; Menton, France; Nov. 2023.
- **AccelNet-MultiNet Summit on the Future of Multilayer Network Science**; Zaragoza, Spain; Nov. 2023.
- **Contagion on Complex Social Systems**; Burlington, Vermont; Aug. 2023.
- **NetSci 2023**; Vienna, Austria; Jul. 2023.
 - * *Contributed talk*: “Decision-making in uncertain networks via dynamic importance.”
- **Network Dynamics and Choice Theory**; Burlington, Vermont; May 2022.

TECHNICAL SKILLS AND SOFTWARE DEVELOPMENT

Core Developer: CoarseNet, a Python package for computing coarse-grained representations of complex networks.

Core Developer: FastPercolation.jl, a Julia package that implements a fast algorithm for percolation processes on networks with compound observables for epidemiological interventions.

Programming Languages: Julia, Python.

Frameworks and Libraries: pandas, scikit-learn, networkx, graph-tool, d3js, observable, jupyter.

PROFESSIONAL REFERENCES

Jean-Gabriel Young

Professor

University of Vermont

Vermont Complex Systems Center

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Laurent Hébert-Dufresne

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