

# Nico Courts

## Mathematician & Data Scientist

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in: nico-courts

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*A warm and sociable mathematician and puzzle nerd with a passion for interpreting patterns in data to help empower the people making society a better place. Collaboration and discovery fuel my soul and comprise an essential part of any potential career. Strong coder in **Python** with experience in **R** and **JavaScript**, among others. Familiarity with solving real-world problems using deep learning packages including **pytorch**, **tensorflow**, and **JAX**. Data visualization nerd with experience in working with visualization frameworks and grammars including **D3.js**, **ggplot**, and **Vega-Lite**.*

### RELEVANT EXPERIENCE

#### Postdoctoral Researcher

June 2022 – Present

Howard Hughes Medical Institute

Matsen Group, Fred Hutch Cancer Center, Seattle, WA

At the moment, I am working to understand how B-cell receptors (BCRs) differentiate during affinity maturation—specifically, how somatic hypermutation introduces point mutations to the BCR sequence, vastly increasing the diversity in BCR binding affinity. My work applies both traditional statistical and deep/attention-based models to identify mutational hot and cold spots and predict nucleotide substitutions.

#### NSIP PhD Intern (Machine Learning)

Summer 2020 – Summer 2021

Pacific Northwest National Laboratory, Seattle, WA

#### Graduate Teaching Assistant & Course Instructor

Sept 2016 – June 2022

University of Washington, Seattle, WA

#### Lead Teaching Assistant and Instructor

Summer 2016

SCS Noonan Scholars (previously South Central Scholars), Los Angeles, CA

### SELECTED PUBLICATIONS

#### Bundle Networks: Fiber Bundles, Local Trivializations, and a Generative Approach to Exploring Many-to-one Maps

Nico Courts and Henry Kvinge

*International Conference on Learning Representations*, 2022.

#### Fuzzy Simplicial Networks: A Topology-Inspired Model to Improve Task Generalization in Few-shot Learning

Henry Kvinge, Zachary New, Nico Courts, et al.

*AAAI Workshop on Meta-Learning and MetaDL Challenge*, PMLR 140:77-89, 2021.

### EDUCATION

Ph.D., Mathematics (Univ. Washington)

June 2022

M.S., Mathematics (Univ. Washington)

March 2020

B.S., Mathematics (Univ. Southern California)

May 2016

### LEADERSHIP & SERVICE

#### Volunteer Judge

June 2020 & 2021

UW Math Hour Olympiad, Seattle, WA

#### Graduate Student Representative

Summer 2019 – Spring 2020

University of Washington Math Dept., Seattle, WA

#### Co-organizer and Mentor

Autumn 2018 – Spring 2021

Washington Directed Reading Program, Seattle, WA