

ERIC M SCHMID

ML/Quantitative Analytics Research Associate

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🔗 GitHub: <https://github.com/ericschmid-uchicago>

📍 Chicago

☆ Site: <https://ericschmid-uchicago.github.io/>

SUMMARY

I am a ML/Quantitative Analytics Research Associate with expertise in developing machine learning models for cryptocurrency forecasting, utilizing tools such as PyTorch and scikit-learn, while also being skilled in functional programming languages including Haskell and dependently typed languages like Agda, Coq, and Idris. My diverse background spans quantitative finance, software development, and academic research, with a particular focus on applying topological data analysis and category theory to financial markets while pursuing a PhD in Mathematical Sciences.

EDUCATION

- 02/2025 - Present

Dublin, Ireland

● PhD in Mathematical Sciences

GCAS College

- Topic: Applied Category Theory & AI
 - Completing remotely
 - Co-advisors: Prof. Fernando Tohmé, Prof. Neil Ghani (Strathclyde), Dr. Toby St. Clere Smithe (Topos Institute)
- 09/2021 - 03/2025

Chicago, IL

● MS in Applied Mathematics

DePaul University

- GPA: 4.0
- 09/2023 - 12/2023

Chicago, IL

● Graduate Coursework in Computer Science

University of Chicago

- Coursework: Introduction to Python Programming (GPA: 4.0)
- 09/2008 - 12/2013

New York, NY

● BA in Individualized Study (Interdisciplinary Studies)

New York University

- Dean's List for & Spring 2009
 - Concentration: Continental Philosophy and Visual Art
 - Minor: Mathematics
 - GPA: 3.589

EXPERIENCE

- 10/2024 - Present

Chicago, IL

● ML/Quantitative Analytics Research Associate

Navier

- Develop and implement machine learning models for cryptocurrency price forecasting using PyTorch and scikit-learn
 - Design and optimize deep learning architectures for time series prediction
 - Implement backtesting frameworks to evaluate model performance
 - Conduct statistical analysis of market data using Python's data science stack
 - Create automated data pipeline for real-time model updates and predictions
- 06/2023 - 10/2024

Chicago, IL

● Co-founder

Bourbaki Capital

- Led a team of developers and analysts, setting team priorities
 - Developed software using Python and interacted with Amazon AWS API
 - Designed and implemented a websocket listener for market data
 - Utilized Python library HFTbacktest for backtesting quantitative financial models
- 10/2016 - 06/2023

Chicago, IL

● Professional Artist

- Exhibited at prestigious galleries and museums across Europe and North America, including Kunsthalle Zürich, Vilma Gold (London), Neue Alte Brücke (Frankfurt), Croy Nielsen (Berlin), Svetlana (New York), Centralbanken (Oslo), Emily Harvey Foundation (New York), M. LeBlanc (Chicago) and Galleria Federico Vavassori (Milan)
- 09/2016 - 10/2016

Chicago, IL

● Temporary Web Development Consultant

Chicago.com

- Created a responsive navigation bar for website using HTML, CSS, Javascript, and JQuery
 - Implemented improvements for social media integration and mobile experience
- 02/2016 - 08/2016

Chicago, IL

● Software Engineering Intern

Raise.com

- Completed software engineering coursework in Java, UNIX and SQL
 - Developed various applications including a hangman game, karaoke jukebox and random sentence generator
- 01/2014 - 10/2015

New York, NY

● Production Manager

Ben Schumacher Studio
- 05/2013 - 08/2013

Chicago, IL




● Web Development Intern

Chicago Sun-Times

SKILLS



AWS	CSS	Deep Learning	ECommerce	GitHub	Grunt	Haskell	HTML	Java	Java Spring	JavaScript
jQuery	Linear Algebra	Unix Shell Scripting	Numpy	Pandas	Python	PyTorch	Scikit-Learn	Scipy	SQL	
Time Series	XGBoost	PostgreSQL	Agda	Coq	Idris	OCaml	Azure	Functional Programming		

FIND ME ONLINE

 GitHub https://github.com/ericschmid-uchicago	 Website https://ericschmid-uchicago.github.io/	 PhilPapers https://philpeople.org/profiles/eric-schmid
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PROJECTS



Macroeconomic Effects on Bitcoin Price Using Topological Data Analysis and Distance-to-Default Metrics

 10/2024 - 12/2024  Chicago, IL

Developed a machine learning model integrating topological data analysis, financial risk metrics, and macroeconomic indicators to predict Bitcoin price movements with performance exceeding random chance.

- Developed ML model predicting Bitcoin trends using Topological Data Analysis and Distance-to-Default metrics, achieving 21% better-than-random AUC (0.6089 in a three-category classification problem)
- Created novel validation approach using shifted 30-day moving averages to reduce volatility impact while avoiding look-ahead bias
- Built XGBoost classifier with time series cross-validation for 3 price categories, achieving 5.9% better accuracy than random chance
- Applied SHAP analysis to identify predictive features, combining TDA metrics with Treasury yields and federal debt data from Yahoo Finance and FRED API

The value of innovation: the economics of targeted drugs for cancer (PUBLISHED in Targeted Oncology)

 2007  Chicago, IL

I analyzed the economic implications of targeted cancer drugs, examining their substantial costs (\$13,000-\$100,000 annually) relative to their clinical benefits and addressing concerns about healthcare resource allocation in an era of breakthrough but expensive oncology therapeutics.

- Co-authored research paper published in Targeted Oncology examining the economic considerations of 16 FDA-approved targeted cancer therapies
- Analyzed cost-effectiveness ratios and insurance reimbursement considerations for novel cancer drugs ranging from \$13,000-\$100,000 per patient annually
- Evaluated economic sustainability challenges of targeted therapies in oncology while acknowledging their breakthrough clinical value
- Recommended methodology improvements for cost-effectiveness studies to better inform healthcare resource allocation decisions
- Explored the complex relationship between drug pricing, patient access, and the value of medical innovation in cancer care

COURSES

Introduction to Python Programming, Numerical Analysis I, Real Analysis I, Finite-Dimensional Vector Spaces, Probability & Statistics I, Abstract Algebra I & II, Point-Set Topology, Mathematical Modeling, Complex Analysis, Group Theory, Number Theory, Commutative Algebra, Category Theory, Mathematical Logic (Model Theory), Algebraic Topology, Calculus I-III, Statistics, Linear Algebra, Discrete Mathematics, Non-Euclidean Geometry

INTERESTS

-  Machine Learning
-  AI
-  Type Theory
-  Category Theory
-  Functional Programming
-  Mathematical Logic