

CATHERINE CHEN

she/her/hers ◊ Updated April 2025

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RESEARCH INTERESTS

interpretability/explainability, information retrieval, natural language processing, large language models, human-centered AI, biomedical applications of ML

EDUCATION

University of Amsterdam

Visiting Researcher, IRLab

Hosted by Maarten de Rijke

Amsterdam, Netherlands

Feb - May 2025

Brown University

Ph.D Candidate in Computer Science

Sc.M in Computer Science

Advised by Carsten Eickhoff (now University of Tübingen)

Providence, RI, USA

Sept 2021 - Present

May 2023

Wellesley College

B.A. in Computer Science and French

Wellesley, MA, USA

Aug 2015 - May 2019

Aix-Marseille University

Study Abroad

Aix-en-Provence, France

Aug 2017 - Jan 2018

PUBLICATIONS

- Gregory Polyakov, **Catherine Chen**, and Carsten Eickhoff. *Towards Best Practices in Axiomatic Activation Patching in Information Retrieval*. To appear in SIGIR 2025.
- Meng Lu, **Catherine Chen**, and Carsten Eickhoff. *Cross-Encoder Rediscovered a Semantic Variant of BM25*. Preprint. arXiv:2502.04645.
- Andrew Parry, **Catherine Chen**, Carsten Eickhoff, and Sean MacAvaney. *MechIR: A Mechanistic Interpretability Framework for Information Retrieval*. ECIR 2025.
- **Catherine Chen**, Jack Merullo, and Carsten Eickhoff. *Axiomatic Causal Interventions for Reverse Engineering Relevance Computation in Neural Retrieval Models*. SIGIR 2024.
- **Catherine Chen** and Carsten Eickhoff. *Evaluating Search System Explainability with Psychometrics and Crowdsourcing*. SIGIR 2024.
- William Rudman, **Catherine Chen**, and Carsten Eickhoff. *Outlier Dimensions Encode Task Specific Knowledge*. EMNLP 2023.
- **Catherine Chen**. *Quantifying and Advancing Information Retrieval System Explainability*. SIGIR 2023.

WORK EXPERIENCE

Blue Cross and Blue Shield of Minnesota

Data Science PhD Intern, AI Models and Platform Team

Remote

June - Sept 2024

- Developed an end-to-end pipeline leveraging LLMs using AWS services (Sagemaker, Bedrock, S3) for automated Behavioral Health case summarization

FreeWheel, A Comcast Company

Software Engineer, Creative Team

New York, NY, USA

Aug 2019 - Aug 2021

- Created UI components for a React-based web application with service-oriented backend architecture containerized with Docker and Kubernetes, allowing media buyers/sellers to manage their ad inventory
- Implemented APIs in Golang with gRPC to ingest/manage advertising creatives stored in AWS S3/MySQL DB

PatientsLikeMe

Software Engineering Intern

Cambridge, MA, USA

June - Aug 2018

- Wrote code using Ruby on Rails and React for a monolithic web app that comprises the world's largest personalized health network, helping people with chronic illnesses connect with one another and find new treatments

University of Massachusetts, Amherst
Research Assistant, Knowledge Discovery Lab

Amherst, MA, USA
June - Aug 2017

- Reverse-engineered Google Deepmind's CNN to identify influential neurons to explain how the network learned to play Atari Breakout

MENTORSHIP

Master's Students

Meng Lu - Brown University

July 2024 - Present

Kora Helm - University of Tübingen

Sept 2023 - July 2024

Undergraduate Students

Pearl Zhang – Swarthmore College – with Jeff Huang

Jan - May 2023

Yuhan Wang – Smith College – with Jeff Huang

Jan - May 2023

Lucas Weissman – Williams College – with Roma Patel

June - Aug 2022

Marwa Bouabid – Mount Holyoke – with James Tompkin

Jan - May 2022

TEACHING

Brown University

CSCI 1460: Computational Linguistics, *Graduate TA*

Sept - Dec 2024

Sheridan Center for Teaching and Learning, *Teaching Certificate I*

Sept - Dec 2023

NSF REU: AI for Computational Creativity, *Research Methods Study Group Leader*

June - Aug 2022, 2023

Wellesley College

CS 235: Theory of Computation, *Supplemental Instructor*

Sept - Dec 2018

INVITED TALKS

Reverse Engineering Mechanisms of Relevance in Neural IR Models

Radboud University

Upcoming May 2025

Leiden University

Upcoming April 2025

Advancing Explainable Information Retrieval: Methods for Human-Centered Evaluation and Interpreting Neural IR Models

University of Glasgow

Sept 2024

Choosing Between Industry and Academia

Brown University, ExploreCSR: Diversity in Computer Systems

April 2023

Women in STEM Workshop: Pursuing a Career in CS

The Stemistry Project

Feb 2023

Using Machine Learning to Predict Startup Success

Wellesley College, Ruhlman Conference

May 2019

Artificial Intelligence: From Fiction to Reality

Wellesley College, Ruhlman Conference

May 2018

LEADERSHIP/SERVICE

Faculty-Grad Liason

Department of Computer Science

Brown University

Fall 2024 - Present

- Communicate with the department about graduate student affairs/concerns and coordinate student volunteer positions

CS Department Representative

Graduate Student Council

Brown University

Sept 2022 - May 2024

- Attended monthly meetings to facilitate collective action on graduate student-related issues

Graduate Student Orientation and Recruitment

Department of Computer Science

Brown University

Jan 2022 - March 2024

- Collaborated with department administrators to organize welcome events for admitted/incoming students

Graduate Community Fellow

Graduate School

Brown University

Sept 2022 - May 2023

- Designed and implemented community-building initiatives for Women and Non-Binary Graduate Students to celebrate diversity, promote belonging and inclusion, and connect individuals across disciplines

Co-Organizer

Workshop on Explainability in Information Retrieval @ SIGIR '25

July 2025

New England NLP Meetup

April 2024

Conference Reviewer

ACL Rolling Review (*EMNLP '24 Outstanding Reviewer*)

2024, 2025

ECIR

2024, 2025

SIGIR

2024, 2025

WSDM

2025

Panelist

Amplify: Students as Leaders: At Wellesley and Beyond

Oct 2024

Wellesley CS Club: Wellesley Careers in Tech Panel

April 2024

AlumConnect: Research at Wellesley

Feb 2024

AI/ML Panel at Hack @ Brown

Feb 2024

Why Wellesley? An AlumConnect Admissions Panel

April 2023

Grad Student Discussion Panel for REU AI @ Brown

Aug 2022

Demystifying Grad School: Conversations with CS Grad Students @ Brown

Mar 2022

Brown CS Grad School Info Panel

Nov 2021

Moderator

Grad Student Discussion Panel for REU AI @ Brown

Aug 2023

Grad Student Discussion Panel for ExploreCSR AI @ Brown

Apr 2023

Women and Non-Binary Faculty Panel @ Brown

Mar 2023

Other Service

Max Planck Institute for Intelligent Systems PhD Application Reader

Nov 2024

Brown CS PhD Application Reader

Jan 2024

Grad Student Mentor for Brown University Grad School Cohort

Sept 2023 - May 2024

Alumnae Mentor for Wellesley College Senior Support Network

Sept 2020 - May 2022

Alumnae Interviewer for Wellesley College Admissions

Sept 2020 - Jan 2020

AWARDS

Research Mobility Fellowship, Brown University

Spring 2025

Graduate Community Fellow, Brown University

Fall 2022 - Spring 2023

SKILLS

Programming

Python, React, JavaScript, Golang, Ruby on Rails, MySQL, HTML, CSS

Practices/Tools

PyTorch, Git, Pandas, AWS Services (Bedrock, Sagemaker, S3), Docker, Kubernetes, Flask, Jira, Confluence, Agile, Scrum

Languages

English, French