# Serafina Kamp

Ann Arbor, Michigan• https://websites.umich.edu/~serafibk/ • serafibk@umich.edu

## Education

**University of Michigan**
PhD Candidate, Computer Science Engineering                              Ann Arbor, MI
Advised by Ben Fish                                                      2022-Present

                                                                        Ann Arbor, MI
**University of Michigan**
Honors Program in the College of Engineering                                     2022
B.S.E. in Computer Science Engineering
Minor in Mathematics and Philosophy
GPA: 3.76/4.00

## Awards

University of Michigan CSE DEI Service Award
2024
Office of Diversity Equity and Inclusion DEI Summit Student Organization Grant        2024
Honorable Mention NSF Graduate Research Fellowship Program                            2022
First Place Undergraduate Poster in ACM Student Research Competition at GHC           2021
Aptiv Scholarship                                                                    2020
Regent's Merit Scholarship                                                           2018
Channel 7 WXYZ Best and Brightest Award                                              2018
Michigan Affiliate NCWIT Award for Aspirations in Computing                          2018

## Current Research Projects

### Bargaining Game Discrimination

In this project, we are interested in understanding sources of discrimination that are not resource-based. We model a bargaining game in a simple hiring market and we are able to prove that discriminatory outcomes (i.e., one group of agents gets a higher payoff than another group) exist at equilibrium even though the hiring market began from a symmetric starting point in terms of *agent skill levels, power in the bargaining game*, and *entitlement to the payoff*. This work (to appear -- see publications) established that discrimination can arise *endogenously* while agents learn to bargain in a simple hiring market. We are continuing this work to understand what conditions and learning mechanisms cause an algorithm to converge to one equilibrium over another.

### Social Relationship Inequality

In this project, we are interested in identifying the properties of social relationships that give evidence that two individuals are socially unequal. We are also interested in understanding the social processes that give rise to social hierarchies, especially those that result in unfair discrimination of some demographic groups over others. We are drawing from the literature in sociology, social psychology, behavioral economics, and related areas to begin to address this questions.

# Work Experience

**Machine Learning Intern**  Royal Oak, MI
Vectorform  May 2021 - Aug 2021

- Collected data from national databases and internal servers to gather historical insights to use in the training models.
- Met with representatives from weather service providers to determine which service would best forecast the information desired from our client.
- Identified and implemented potential solutions to load forecasting through research papers.
- Discovered two models that led to success for forecasting electric load, benchmarked by the Microsoft Azure model.
- Developed technical documentation to track project methodology and results.
- Completed Microsoft Azure AI Fundamentals course and obtained certification.

**Undergraduate Intern**  Malibu, CA
HRL Laboratories  Jan 2021 - Apr 2021

- Wrote simulations with SeQUeNCe for Quantum Network repeater protocols in Python to evaluate the efficiency of network topologies.
- Verified protocol implementation details and results with existing academic papers including identifying realistic hardware parameters.

**Research Assistant**  Ann Arbor, MI
Summer Undergraduate Research Experience, University of Michigan  May 2021 - Aug 2021

- Assisted in improving table detection machine learning algorithms by collecting and annotating training data for existing methods and evaluating current methods by comparing to other well-known methods in the area.
- Compared current techniques with other popular object detection architectures, YOLOv3 and FRCNN, through literature review and implementation of these techniques for the task of table detection.
- Conducted a thorough literature review on and summarized the main techniques of relation extraction as part of a larger survey paper on the field of text extraction.
- Collected and annotated 2,000 table images to improve existing CNN in the task of table detection on technical manuals.
- Found that performance could be improved by combining the YOLOv3 architecture with our current methods since the union of the areas proposed by the two networks covered the most table areas.

**Research Assistant**  Ann Arbor, MI
Secure Cloud Manufacturing, University of Michigan  Jan 2019 - Dec 2019

- Collaborated in a Multidisciplinary Design team to investigate the security of cyber physical systems in manufacturing processes.
- Created threat model to assess vulnerabilities in a hypothetical decision making software

connected with the physical manufacturing testbed.
- Developed a local API in Java to handle data retrieval and processing from the testbed.
- Assisted in setting up a gRPC server in Java on the local testbed which communicated with the above local API to allow for remote access of data.
- Presented poster at Design Exposition at University of Michigan.

# Teaching Experience

**Graduate Student Instructor**  Ann Arbor, MI
EECS 298 Social Consequences of Computing, University of Michigan     Jan 2024 - Present

- Developed homework and lab assignments which include Python programming and reflection questions.
- Lead a weekly lab section reviewing lecture concepts and Python programming.
- Held weekly office hours to help with developing group projects and homework questions.

**Teaching Assistant**  Ann Arbor, MI
Michigan Institute of Data Science, University of Michigan     Jul 2022 - Aug 2022

- Created and taught a lab in Python exploring k-means to segment images and how this preprocessing affects downstream machine learning tasks.

**Instructional Aide**  Ann Arbor, MI
EECS 445 Introduction to Machine Learning, University of Michigan     Jan 2021 - Aug 2022

- Facilitated a discussion section to reinforce concepts learned in lecture.
- Provided support to students by answering questions online and in office hours.
- Assisted in writing homeworks, projects, and discussion notes.

**Summer Instructor**  Ann Arbor, MI
ID Tech Camps     May 2019 - Aug 2019

- Designed a week-long lesson plan based on an established curriculum.
- Taught kids aged 10-12 in courses of (1) video game design and development in RPG maker and (2) Pi-top assembly and coding in python.
- Worked with groups of 8-10 kids each week and helped them finish an individual project in the scope of the curriculum.

# Publications and Preprints

**Kamp, S.**, Nkeng, T., Riquelme, V., Fish, B. Beliefs, Relationships, and Equality: An Alternative Source of Discrimination in a Symmetric Hiring Market via Threats (To appear)

**Kamp, S.**, Fayazi, M., Benameur-El, Z., Yu, S., & Dreslinski, R. (2023). Open Information Extraction: A Review of Baseline Techniques, Approaches, and Applications. arXiv preprint arXiv:2310.11644.

Colter, Z., Fayazi, M., Benameur-El Youbi, Z., **Kamp, S.**, Yu, S., & Dreslinski, R. (2022). Tablext: A combined neural network and heuristic based table extractor. Array, 15, 100220.

**Kamp, S.**, Zhao, A. L. L., & Kutty, S. (2021, September). Robustness of Fairness: An Experimental Analysis. In Joint European Conference on Machine Learning and Knowledge Discovery in Databases (pp. 591-606). Springer, Cham.

# Presentations

Talk for accepted paper at BIAS workshop at ECML PKDD, Politecnico di Torino          2023
AI Symposium poster presentation, University of Michigan          2021
Talk for accepted poster, Grace Hopper Celebration (GHC)          2021
MDP Design Exposition poster presentation, University of Michigan          2019

# Extracurriculars

**Mechanism Design 4 Social Good Inequality Working Group Member**          Jan 2024-Present

I participate in a working group of researchers interested in reducing economic inequality. There are bi-weekly presentations and discussions on recent work on topics like game theoretic models of inequality and proposed economic interventions on inequality.

**Algorithmic Fairness Reading Group Organizer**          Sep 2023-Present

I started and currently organize the algorithmic fairness reading group at the University of Michigan. We meet weekly to present on recent papers in the field and have a group discussion to engage with the work.

**Computer Science Engineering Graduates (CSEG) DEI Co-Chair**          Jun 2023-Jun 2024

I helped organize DEI initiatives for graduate students at the University of Michigan. I also volunteered at social events for current graduate students as well as at outreach events for prospective graduate students. We applied for and were awarded a DEI Summit Student Organization Grant for $2500 to plan and host an event to promote DEI in the CSE department.