Nicole Meister

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Summary

Nicole hopes to pursue a CS PhD to research machine learning fairness, AI ethics, and bias mitigation techniques in ML. She is driven by a desire to see technical education expand and especially interested in redistributing and sharing resources to support and uplift under-served communities.

Education

Princeton University - B.S.E. Electrical and Computer Engineering *Princeton, NJ*

Minors: Computer Science, Robotics, & Cognitive Science *2018 - 2022*

Relevant Undergrad Coursework: Computer Vision, Intro to ML, Natural Language Processing, Algorithms & Data Structures, Systems, Circuit Design, Advanced Programming Techniques, Probability, Intro to Robotics, Contemporary Logic Design, Information Signals, Robotic Systems Lab, Quantum Computing, Electronic Circuits, Computational Models of Cognition *Grad Coursework:* Advanced Computer Vision

Publications

[Re] Don't Judge an Object by Its Context: Learning to Overcome Contextual Bias

ReScience C Journal Paper 2021

SSY Kim, S Zhang, **N Meister**, O Russakovsky

Child Marriage, Human Trafficking: An Empirical Ecosystem Analysis for Bangladesh

Manuscript in Review in Journal of Human Trafficking 2021

G Vink, K Carlson, E Phillips, S Szeto, J Park, M Jackson, **N Meister**

Methods to Identify Patient Clusters and Build Precision Analytics for Diagnosis

Conference Poster Presented in ACTRIMS 2019 (Leading Multiple Sclerosis Conference)

N Meister, H Cowley, C Rivera, K Gray-Roncal, K Fitzgerald, C Allshouse, A Duerr, A Sah, P Nagy, P Calabresi, A Rose, E Mowry, W Gray-Roncal

Robust and Scalable Deep Learning for X-ray Image Analysis

Conference Paper in New York Scientific Data Summit 2017

N Meister, Z Guan, J Wang, R Lashley, J Liu, J Lhermitte, K Yager, H Qin, B Sun, D Yu.

Research Experience

Adobe Research - Natural Language Group *Remote*

Research Intern advised by Dr. Franck Dernoncourt *May 2021 - Present*

- Developed new reading assistant tool in Acrobat (SmartAcronyms) that extracts acronyms and their definition from text with 95% accuracy, lists acronyms in acronym glossary, and provides definition upon hover over acronym *(C Programming)*
- Conducted 10 user studies and analyzed text corpora for acronym prevalence to motivate feature presentation to PMs
- Increased efficiency of acronym extraction method by 21x while maintaining precision and recall *(Python)*
- Creating largest available dataset for acronym disambiguation challenge and conducted experiments to improve acronym disambiguation

Princeton University Computer Science Dept. - Visual AI Lab *Remote*

Research Assistant advised by Prof. Olga Russakovsky *Oct 2020 - Present*

- Worked in a group of 3 to reproduce from scratch Singh et al. (CVPR 2020) that mitigates contextual bias in object and attribute recognition
- One of 23/82 reports accepted for publication from ML Reproducibility Challenge 2020 *(Python, Pytorch)*

Novametrics *Remote*

Research Assistant advised by Dr. Greg van der Vink *Dec 2020 - Feb 2021*

- Analyzed international child marriage trends to identify relationship with human trafficking metrics and visualize change in child marriage rates.
- Co-authored paper in review (Journal of Human Trafficking), findings presented to US Embassy in Bangladesh and included in USAID Report.

NSF Funded REU (Engineers for Exploration) University of San Diego *Remote*

Research Assistant advised by Prof. Ryan Kastner (with Microsoft AI for Earth, Scripps, National Geographic) *Jul 2020 - Sept 2020*

- Built web application to allow conservation groups to use CNNs to quantify and monitor mangroves within their site by uploading cheaply acquired high resolution imagery (drone imagery). Application used by Jamaican mangrove conservation groups
- Developed frontend using HTML, CSS, JS, JQuery, Bootstrap, developed backend using Microsoft Azure (Blob Storage and Azure Functions), Flask, Python, Redis. Leveraged cloud computing to store and classify drone imagery

Princeton University Electrical and Computer Engineering Dept. *Remote*

Research Assistant advised by Prof. Fleischer *May 2020 - Jul 2020*

- Experimented with advancements to the t-SNE clustering method to improving clustering COVID X-Ray Images

Max Planck Institute for Collective Behaviour

Konstanz, Germany

Research Intern advised by Prof. Iain Couzin

Jun 2019 - Aug 2019

- Developed a python based toolkit to identify and classify tactile interactions from a video of locusts in an experiment. Used toolkit to analyze limb interactions from a video of locusts to support the theory of cannibalistic nature of locusts

Johns Hopkins University Applied Physics Laboratory

Laurel, MD

Research Intern advised by Dr. Will Gray Roncal

Jun 2016 - Dec 2018

- Implemented machine learning algorithms to predict prognosis of Multiple Sclerosis patients (able to predict walk time within 1 second accuracy). Used k-means to cluster patients and produce more accurate predictions.

Projects

Exploring Debiasing Sentence Representations

2021 Natural Language Processing Course Project

- Reproduced NAACL Paper to debias sentence representations, researched effects of size of context window on method. *(Python)*

Dance Dance Revolution (DDR) Robot

2021 Robotics Course Project

- Omni-wheeled robot that plays DDR by using computer vision to process DDR videos to extract dance moves (up, down left, right) to move and flash LED strip colors accordingly *(Arduino, Python)*

Implementing Facial Feature Segmentation to Aid American Sign Language Recognition

2021 Computer Vision Project

- Built CNN-LSTM to recognize ASL gestures with 95% accuracy *(Python, Pytorch)*

Princeton Dance Schedule

2020 Advanced Programming Techniques Course Project

- Developed website to schedule and book dance studios. I worked on front-end and back-end to implement a scheduling algorithm to replace 40 hours of administrative work (currently used by Princeton Arts Council) Advisor: Prof. Dondero *(Python, Django, SQL, HTML/CSS, JavaScript, JQuery, Bootstrap, Heroku)*

Side Projects

Independent Projects

- 2019: SyncMe: Calculated synchronicity of user-uploaded dance photos from position vectors *(Python, JavaScript, Flask)*
- 2018: *Bachelorette* Data Analysis: Predicted reality TV show winner based on Age, Height *(Python, Sklearn, Numpy)*
- 2018: Sentiment Analysis on Q&A Blog: Performed on web-scraped text from Princeton Q&A blog *(Python, Pandas, Numpy, Google Cloud)*

Awards

2021 **Adobe Award Symposium,** selected to present internship project to Adobe CEO and Adobe Research VP

2021 **Adobe Research Women-In-Tech Scholarship,** $10k for outstanding work in research and outreach

2020 **NCWIT Collegiate Award,** finalist for outstanding technical accomplishments in computer science research

2020 **Dale Summer Award,** top 12 Princeton students to receive $5k stipend to pursue personal project

2018 **Finalist,** HackPrinceton Best Machine Learning Hack

2017 **NCWIT,** Aspirations in Computing National Award

Leadership & Teaching

Data Science for Social Good

Remote

Founder

Jun 2020 - Present

- Created a free 6-week course to empower high school students with the skills to leverage data science and web development
- Taught 20 hours/week online, prepared detailed lesson plans, mentored 21 students from historically underrepresented minority groups to complete a data analytics project. This free program hopes to make STEM more accessible to all.
- Improved program in second year by recruiting 10 program alumni to teach, advertise, and coordinate logistics of program.

Princeton Science Olympiad Invitational (High School Science Competition)

Princeton, NJ

Co-Director

Aug 2019 - Feb 2020

- Managed 30 person team, $23k budget, 140 volunteers, 800 participants
- Prioritized accessibility, becoming first ever invitational to provide travel scholarships to teams and no attendance fee.

Princeton University Computer Science Department

Princeton, NJ

TA, Grader, Peer Tutor

Jan 2020 - Present

- TA for **COS 306: Contemporary Logic Design**, providing assistance to students on labs; 1:1 Tutor for **introductory computer science classes**
- Graded for **COS 217: Programming Systems** & **COS 429: Computer Vision**, providing feedback to students regarding style, efficiency, design