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# Elijah Tamarchenko

## Education

Sept 2019 - June 2023 **B.A. Computer Science & Statistics - Highest Honors**, *Williams College*
Final Grade: 3.85/4.0, cum laude. Relevant Coursework: Causal Inference, Machine Learning, Natural Language Processing, Time Series Analysis, Generalized Linear Models, Statistical Inference, Information Theory, Probability, Algorithms, Linear Algebra, Data Structures.

Spring 2022 **Study Abroad**, *AIT Budapest*
Final Grade: 5.0/5.0. Relevant Courses: Deep Learning, Computational Biology, Complex Network Analysis, Theory of Computing

## Undergraduate Honors Thesis

Title *Combining Optimal Adjustment Set Selection and Post Selection Inference in Unknown Causal Graphs*

Supervisors Rohit Bhattacharya, Katie Keith

Description I developed a parametric continuous optimization procedure that performs both covariate selection and effect estimation in a single step. I also proved that the procedure identifies the optimal adjustment set in the absence of unmeasured confounders. Using an auxiliary variable under mild assumptions, if the continuous optimization procedure excludes this auxiliary variable from the covariate selection process, then the effect estimate is provably unbiased even in settings with unmeasured confounders. The procedure often leads to a practical reduction in variance as shown in simulations

## Research Experience

May 2022 - June 2023 **Undergraduate Student Researcher**, *Williams College*, Computer Science
Worked on model selection techniques in hidden graphs, as well as estimation of counterfactual outcome distributions. Presented research at ACIC (American Causal Inference Conference)

Sept 2019 - Sept 2020 **Undergraduate Research Assistant**, *Williams College*, Psychology
Worked on study examining the impact of gesture and language use on the spacial working memory of children. Developed app to use for testing in study

## Industry Experience

July 2023 - Present **Software Engineer**, *InterSystems Corporation*
Used multi threading and parallelization to increase cloud deployment speed by 300%. Authored comprehensive guidelines and created standard for modern application development using angular within the company, serving as go-to-expert

May 2021 - Sept 2021 **Data Engineering Intern**, *OneMarketData LLC*
Designed time-series forecasting models on large market datasets for business clients. Created the data pipeline architecture for processing/migrating of 3rd party telemetry data into existing software system.

## Teaching

Spring 2023 **Teaching Assistant**, *STAT 442: Statistical Learning and Data Mining*

Fall 2022 **Teaching Assistant**, *STAT 346: Regression Theory and Applications*

Fall 2021 **Teaching Assistant**, *CSCI 256: Algorithm Design & Analysis*

Spring 2021 **Teaching Assistant**, *CSCI 237: Computer Organization*

Fall 2020 **Teaching Assistant**, *CSCI 136: Data Structures and Algorithms*

## Awards and Honors

June 2023 **Sam Goldberg Colloquium Prize in Mathematics for Statistics**
Awarded for best colloquium talk in statistics

Sept 2019 - June 2023 **V-Nee Yeh 1981 Scholarship**
Full scholarship to Williams College - 4 years

Oct 2019 **Questbridge Scholar**

Sept 2019 **National Merit Scholarship**
Awarded to top 1% of students nationally

## (Selected) Projects

2022 **Research Abstract Classification**
Compared the performance of LSTM and transformers on classifying research papers based on their abstract, achieving and accuracy of 92% by finetuning models

2022 **Evolution Simulator**
A program that simulates natural selection and evolution through the reproduction of simple dot organisms over many generations, allowing analysis of various organism behaviors.

2021 **Analysis of School Funding on Student Achievement**
A causal analysis using machine learning of school funding levels and student proficiency, which proved that decreases in school funding can account for about 18,000 students in MA being deemed not academically proficient.

2020 - 2021 **Williams Students Online**
Implemented professor review feature on the student website, used by over 2000+ students

## (Selected) Skills

Programming Python, R, Javascript, SQL, Java, ObjectScript, Go

Technologies Tensorflow, pytorch, Docker, Angular

Languages English (Native), Russian (Native), Italian (Proficient), Spanish (Intermediate)