

Anna Badalyan

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About me

Machine learning engineer and researcher passionate about 3D computer vision. I am convinced that my rigorous academic background and diverse experience enable me to develop cutting-edge technology for the social good.

Education

M.S. in Data Science, University of Padua – Padua, Italy Oct 2021 – Feb 2024

- GPA: 29.3/30.0 (Graduated with honors)
- Curriculum in Mathematics for Data Science
- **Thesis:** Inference and Community Detection in Hypergraphs: Incorporating Node Attributes ([link to text](#))

B.S. in Economics, National Research University Higher School of Economics – Moscow, Russia Oct 2015 – Jun 2019

- GPA: 8.04/10.0
- **Thesis:** Opportunities and Limitations of the Program of Digitalization of the Economy of Italy (“Industria 4.0”)

Experience

Research Intern, ELLIS Institute Tübingen – Tübingen, Germany June 2024 – Nov 2024

- Supervised by Celestine Mender-Dünner
- Studied the usage of LLMs in social science surveys

Guest Scientist, Max Planck Institute for Intelligent Systems – (remote, part-time) Feb 2024 – May 2024

- Conducted experiments, which led to the publication of the paper.

Research Intern, Max Planck Institute for Intelligent Systems – Tübingen, Germany April 2023 – Oct 2023

- Developed a stochastic block model for community detection and inference on hypergraphs, which incorporates node attributes.
- Conducted experiments to evaluate the performance of the model and analysed results.
- Supervised by Caterina De Bacco.

Data Science Tutor, University of Padua – Padua, Italy Oct 2022 – Jul 2023

- Helped first-year Data Science students with Computer Science and Mathematics related subjects.
- Carried out 50 hours of teaching activities.

Research Intern, Machine Learning Group, University of Padua – Padua, Italy Sept 2022 – Oct 2022

- Worked on improving natural language understanding by applying the concept of discursive repertoires.
- Improved the performance of BERT based classifier by fine tuning model parameters.

Assistant and Researcher, Liaison Office – Tashkent, Uzbekistan Sept 2019 – Oct 2021

- Collected and analyzed security and drug-related data in Central Asian countries.
- Used NLP techniques to create a news filter app for efficient news search.

Junior Data Analyst, Valiotti Analytics – (remote) Apr 2021 – July 2021

- Analyzed data of the game app using Redash and SQL.
- Created dashboards in Redash, Tableau and Power BI.

Web Developer, Self Employed – (remote) Aug 2018 – Aug 2019

- Built web pages using HTML, CSS, and JavaScript

Teaching Assistant, National Research University Higher School of Economics – Moscow, Russia Feb 2017 – Jun 2017

- Teaching assistant for the Introduction to World Economy course.

Research Assistant, National Research University Higher School of Economics –
Moscow, Russia

Dec 2016 – Feb 2017

- Collected data from census archives.

Publications

Structure and inference in hypergraphs with node attributes

Aug 2024

Anna Badalyan, Nicolò Ruggeri, Caterina De Bacco

10.1038/s41467-024-51388-5

Projects

Frank Wolfe for Cluster Detection on Hypergraphs

[github link](#)

- Implemented Frank Wolfe variants to solve maximum clique problem on uniform hypergraphs.

COVID-19 prediction from X-ray images: explainability

- Discovered that simplest NN architectures works similarly well to the advanced ones due to the bias in the provided dataset.

Click Models

[github link](#)

- Built probabilistic click models for predicting the relevance of web search.
- Implemented Maximum Likelihood and Expectation Maximization algorithms from scratch.

News filter

[github link](#)

- Implemented a web app that filters news by keywords.
- Tools: Python, Django, JavaScript.

Additional Experience And Awards

Challenges in Building Billion Users Cloud Applications, Summer School –
Varena, Italy

Sept 2023

- Top 5% students based on the GPA were selected to participate in the program.

Data Analytics Nanodegree, Udacity

Nov 2020 – Dec 2020

- Won an Uzbek nationwide competition and received a scholarship to participate in the program.

Academic Exchange Program Erasmus Plus, University of Rome Tor Vergata –
Rome, Italy

Feb 2018 – Jul 2018

- Awarded a highly competitive Erasmus Plus scholarship to participate in an Exchange program abroad.

Vyshaya Proba Mathematics Olympiad, 2nd degree awardee

2015

- Became a 2nd degree awardee of an international Mathematics Olympiad carried out by National Research University Higher School of Economics among high-school students.

References

Dr. Caterina De Bacco – Supervisor at Max Planck Institute for Intelligent Systems, email: c.debacco@tudelft.nl

Prof. Wolfgang Erb – Master thesis supervisor at University of Padua, email: wolfgang.erb@unipd.it

Technologies

Computer Languages: Python (advanced), R (intermediate), Java (beginner), SQL (intermediate).

Natural Languages: Armenian (intermediate), English (proficient), French (intermediate), German (mit Karte, bitte¹), Italian (proficient), Russian (proficient), Uzbek (intermediate).

¹The expression is used when doing shopping and paying with card meaning "with card, please". This is one of the few expressions that I am able to use confidently in my daily communications in German.