

EUXHEN HASANAJ

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EDUCATION

Carnegie Mellon University

Doctor of Philosophy in Machine Learning | GPA: 4.00

Master of Science in Machine Learning | GPA: 4.15

Pittsburgh, PA

Aug. 2021 – Expected 2024

Aug. 2019 – Dec. 2020

American University in Bulgaria

Bachelor of Arts in Computer Science (Honors) | GPA: 4.00

Bachelor of Arts in Mathematics (Honors) | GPA: 4.00

Blagoevgrad, Bulgaria

Sep. 2015 – May 2019

Sep. 2015 – May 2019

University of Iowa – Exchange Student (ISEP) | GPA: 4.07

Spring 2018

WORK EXPERIENCE

Computational and Systems Biology Research Intern

Sanofi

Cambridge, MA

May. 2023 – Aug. 2023

- Developed a pseudotemporal ordering algorithm based on multi-commodity flow to learn endotypes from clinical data. Applied the method to psoriasis, COVID-19, and Crohn's disease.

Machine Learning Research Intern

Genesis Therapeutics

Burlingame, CA

May. 2022 – Aug. 2022

- Researched and developed transformer-based models for de novo drug design, optimizing for novelty and diversity of molecules. Achieved SOTA performance on existing in-house benchmarks.

Machine Learning Engineer

Ritech Solutions

Tirane, Albania

Jan. 2021 – Aug. 2021

- Proposed and implemented novel computer vision models for various tasks such as monocular depth estimation, image classification, and image segmentation.

Machine Learning Engineer

Centroida

Sofia, Bulgaria

Nov. 2017 – Aug. 2018

- Investigated deep learning methods for real-time face detection and developed face tracking algorithms.
- Implemented CUDA kernels for NVIDIA TensorRT to optimize model inference time.

RESEARCH EXPERIENCE

Research Assistant

Carnegie Mellon University | Advisors: Ziv Bar-Joseph, Barnabás Póczos

Pittsburgh, PA

Dec. 2019 – Present

- Leveraging machine learning to uncover mechanisms involved in cellular senescence and aging.
- Developed Phenotype Cover [↗](#), a method for determining minimal sets of marker genes that “separate” phenotypes in scRNA-seq data.
- Implemented a scalable single-cell analysis pipeline named Cellar which supports clustering, visualization, and analysis of single-cell omics and spatial transcriptomics data [\[GUI\]](#) [\[code\]](#).

Laboratory Intern

University of Pittsburgh Medical Center (UPMC) | Supervisor: Oliver Eickelberg

Pittsburgh, PA

Nov. 2022 – Present

- Performing gene knockout/overexpression experiments and Bleomycin-induced DNA damage to determine causal effects of marker genes on cellular senescence.

Senior Projects

American University in Bulgaria | Mathematics | Advisor: Alexander Ganchev

Blagoevgrad, Bulgaria

Spring 2019

- Investigated applications of Category Theory in machine learning and attempted to formalize the language of learning theory through the lens of categories and composition.

American University in Bulgaria | Computer Science | Advisor: Dimitar Christozov

Fall 2018

- Developed convolutional neural networks to detect [pneumonia cases in medical images](#) [↗](#).

SELECTED PUBLICATIONS [\[GOOGLE SCHOLAR\]](#)

- Multiset multicover methods for discriminative marker selection** [\[CR Methods\]](#) [\[code\]](#)
Euxhen Hasanaj, Amir Alavi, Anupam Gupta, Barnabás Póczos, Ziv Bar-Joseph *Cell Reports Methods* Oct. 2022
- Interactive single-cell data analysis using Cellar** [\[NatureComm\]](#) [\[GUI\]](#) [\[code\]](#)
Euxhen Hasanaj, Jingtao Wang, Arjun Sarathi, Jun Ding, Ziv Bar-Joseph *Nature Communications* 13:1 Apr. 2022

HONORS AND AWARDS

COMPETITIONS

- 2022 **4th place**, NeurIPS AutoML Decathlon Competition
- 2019 **Silver Medal**, International Mathematics Competition for University Students (IMC)
- 2018 **Silver Medal**, Computational Mathematics Competition, Bulgaria
- 2018 **Honorable Mention**, International Mathematics Competition for University Students (IMC)
- 2017 **Bronze Medal** (team), ACM, Southeastern Europe Regional Programming Contest, Romania
- 2017 **2nd Place** (team), National Programming Contest, Bulgaria
- 2016 **Honorable Mention** (team), ACM, Southeastern Europe Regional Programming Contest, Romania
- 2015 **Honorable Mention**, International Mathematical Olympiad (IMO), Thailand
- 2015 **2nd Place**, National Mathematical Olympiad, Albania
- 2015 **3rd Place**, National Chemistry Olympiad, Albania

ACADEMIA

- 2019-20 **Excellence Fellow**, Ministry of Education, Sport and Youth, Albania
- 2019 **Salutatorian – Class of 2019**, American University in Bulgaria
- 2019 **Outstanding Achievement in Computer Science**, American University in Bulgaria
- 2019 **Outstanding Achievement in Mathematics**, American University in Bulgaria
- 2015-19 **Dean's List**, American University in Bulgaria
- 2015-19 **AADF Scholar**, Albanian-American Development Foundation

ACADEMIC SERVICE

JOURNAL REVIEWER

- American Journal of Respiratory and Critical Care Medicine** Impact Factor: 24.7
- CARNEGIE MELLON UNIVERSITY — Teaching Assistant
- Machine Learning with Large Datasets** (Spring 2023), **Convex Optimization** (Fall 2022)
- AMERICAN UNIVERSITY IN BULGARIA — Teaching Assistant
- Abstract Algebra** (Fall 2018), **Math. Statistics** (Fall 2018), **Calculus I** (Spring 2017), **Linear Algebra** (Fall 2017)

ORGANIZATIONS

NIH CELLULAR SENESCENCE NETWORK (SENNET) CONSORTIUM

- Member - Consortium Organization and Data Coordinating Center (CODCC)* Sep. 2022 – Present
- Helping harmonize and integrate efforts from all SenNet sites to create atlases of senescent cells.
 - Developing methods to discover senescence biomarkers as a member of the Biomarker Working Group.

NIH HUMAN BIOMOLECULAR ATLAS PROGRAM (HUBMAP) CONSORTIUM

- Member - Platform Development and Data Analysis Team* Aug. 2019 – Dec. 2020
- Developed software tools to enable large-scale collaborations, integration, and comparisons across many different single-cell omics platforms and modalities.

MATHEMATICS CLUB (POLYGON)

- Founder/President* American University in Bulgaria
Sep. 2017 – May 2019
- Organized several events including talks by students and professors, mathematics competitions, and social events between math students and professors.