

Hovhannes Tamoyan

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 Google Scholar  Semantic Scholar

Education

Doctoral Researcher (UKP Lab)

Technical University of Darmstadt *Apr 2023 - Present*

"Theory of NLP"

Supervisor - Prof. Iryna Gurevych, Prof. Eduard Hovy

Master of Science in Computer and Information Science

American University of Armenia (AUA) *Aug 2019 - June 2021*

"Bilingual Sentence Alignment Using Multilingual Language Models"

Supervisor - Karen Hambardzumyan *GPA - 3.77*

Master of Nuclear Physics

Yerevan State University (YSU) *Sep 2019 - May 2021*

"Optimization of Nonlinear Dynamics in CANDLE Storage Ring"

Supervisor - Prof. Vasili Tsakanov *GPA - 3.40*

Bachelor of Nuclear Reactor Physics

Yerevan State University (YSU) *Sep 2015 - May 2019*

"The Emittance Measurement of Electron Beam for AREAL"

Supervisor - Prof. Vasili Tsakanov *GPA - 4.00*

Research Experience

Machine Learning Researcher / YerevaNN *Jun 2020 - Feb 2023*

- Worked on Multi-Modal model [CM3Leon](#). Tackled the question on how to do zero-shot segmentation using cm3leon attention maps. Worked on the interpretability part.
- Worked on [Diffusion](#) and [Mixture of Expert](#) models in collaboration with Meta AI (FAIR).
- Worked on pre-training of molecular representations proposing [BARTSmiles](#) model and the [interpretability](#) of chemistry tasks (regression and classification) results. Applied active learning techniques to annotate given unlabelled data samples.
- Worked on Cross-Lingual Zero-Shot transfer using [prompt-based learning](#).
- Researched [bilingual sentence alignment](#) problems in low-resource languages and low-resource (e.g., biomedical) domains of rich languages, using [multilingual language models](#).
- Proposed NMT [system and preprocessing](#) pipeline for the WMT20 Biomedical Translation task, resulting in the best BLEU scores in English-Russian directions, producing reasonably good scores for English-German directions on the human evaluation stage.
- Created a parallel sentence preprocessing toolkit: [parasite](#).

Physics Researcher / CANDLE SRI *Mar 2018 - Mar 2020*

- Worked on electron beam Emittance measurement on the AREAL linac.
- Implemented features to measure emittance and other beam parameters using Python. Designed a GUI (PyQt5) to control all possible parts of the accelerator related to Beam Diagnostics.
- Upgraded the existing beam diagnostic system from MatLab to Python (JIT), resulting in a performance increase of 1.8 times.

Engineering Experience

Machine Learning Engineer / Aim *Aug 2022 - Feb 2023*

- Contributing to Open-Source Experiment Tracking tool that helps to log, store and compare thousands of experiments and aggregate them to get insights.
- Implementing new integrations, maintaining and extending existing integrations with ML Frameworks, MLOps tools, and utility tools.

Machine Learning Engineer / ZERØ *Nov 2021 - Mar 2022*

- Worked on Document Classification task on law domain datasets.
- Developed an NLP-specific framework: [tmynNLP](#), for running and tracking stochastic and deterministic experiments.
- Created high-level abstractions, dependency injection, parameter reading, multiprocessing, caching, model deployment, and experiment tracking mechanisms for tmynNLP.

Software Engineer / Birthright Armenia *Sep 2019 - Mar 2022*

- Developed a large-scale CMS system for local Database management.
- Built an Email Management System. Created functionality to add a custom query to automatically send emails using a high-level language.
- Worked on security concerns for the system: OS modifications, preventing common threats occurrence.

Full-Stack Web Developer / Floopen *Mar 2017 - Nov 2018*

- Built a general-purpose CMS system using PHP, JavaScript, and MySQL.
- Have done numerous efficiency improvements on the existing websites: decreasing the loading times by 2.7 times on average.
- Developed and maintained websites, adding new features.

Teaching Experience

Monitor - "LxMLS 2023" / *July 2023*

Instituto Superior Técnico (IST)

- Wrote the guide for the "Transformers Day" conducted by Kyunghyun Cho.
- Guided researchers, graduate students, and industry practitioners for lab sessions.

Teaching Associate - "Deep Learning" / AUA *Aug - Dec 2021*

- Conducted weekly Problem Solving Sessions.
- Delivered extra lectures on "Introduction to NLP".
- Implemented the fundamental architectures in Deep Learning
- Built data processing pipelines, and training/evaluating models.
- Taught Python and PyTorch on the Colab environment.
- Composed and graded Homework/Exams.

Teaching Associate - "Data Structures and Algorithms for Data Science" / AUA *Aug - Dec 2021*

- Conducted weekly **Problem Solving Sessions**.
- Taught **Python** and **OOP** in **Python**.
- Solving classic and challenging problems using **Python**.
- Composing and Grading **Homeworks**.

Skills

Programming	Python, JavaScript, C, Java
Machine Learning	PyTorch, TensorFlow, FairSeq, AllenNLP, Huggingface Transformers
Database Systems	SQL, NoSQL, GraphQL
Operating Systems	UNIX/Linux (Debian, Kali Linux)

Extracurricular Activity

Award / WMT20 Winner *Aug 2020*
WMT20 Biomedical Translation task, **English-Russian** pair winner based on reported scores on the test set.

Project / Hands on Data Scraping practical Guide - "Data Scraping" course at AUA *Aug 2020*
Created a practical guide on hands-on-data scraping for people from all occupations. By explaining the essentials of web pages and a detailed guide on how to use **scrapy**, **selenium**, and other libs to scrap data.

Project / Uncovering Picasso "The Bull" plate transitions - "Image Processing" course at AUA *May 2020*
Experimented to obtain a transition from a plate image to another one using **Java**. Succeed on one of the transitions by applying the **Hough transform**, and **Fourier transform**.

Project / Image colorization - "Deep Learning" course at AUA *May 2020*
Designed a **CNN(VGG)** based model using **TF** and **Keras** to do image colorization (predict plausible coloring) using a grayscale image.

Project / AI based WAF(Web Application Firewall) - "Cyber Security" course at AUA *May 2020*

Created an ecosystem: "grad_secure", to protect a web server from potential malicious requests. Trained a **Machine Learning Classifier (Random Forest)** on requests containing payloads (**XSS** and **SQL injections**) and normal request bodies.

Hackaton / ArmBounty(Bug Bounty) *Feb 2020*
Did penetration testing on a live web system, found and reported vulnerabilities and possible destructibility using **Burp suite**, **ZAP**, **Hydra**, etc.

Summer School / Introduction to Accelerator Physics - CAS(CERN Accelerator School) *Sep 2019*
Studied the fundamentals of **Beam Dynamics** and underlying accelerator systems.
Experimented with **Python** scripts to calculate key quantities.

Scholarship / Artem Alikhanian's Scholarship *Jan 2019*
Artem Alikhanyan Award: awarded for academic excellence in university.

Hackaton / Beeline and MIC Armenia Hackaton *Oct 2017*
Created a system(**Web, Mobile App**) to mitigate user-telecommunication company communication using **Java** and **PHP**.

Workshop lecturer / Vanadzor Technology Center *Jul 2017*
Conducted a course: "**Introduction to Physics**". Taught **Calculus**, **Linear Algebra**, and **Physics** to High school students to boost **problems solving skills** and develop **comprehensive thinking**.