Hamza Tahboub

linkedin.com/in/hamzatahboub
Availability: July–December, 2023

tahboub.h@northeastern.edu
+1 (858) 371-8866
Boston, MA

Education

- **Northeastern University, Khoury College of Computer Sciences** — Boston, United States
  Bachelor of Science — Data Science, Math Minor; GPA: 3.9, Dean's List — *2021 - 2025*

  Relevant Courses: Advanced Programming with Data, Advanced Linear Algebra, Statistics and Stochastic Processes, Introduction to Data Management and Processing (graduate course), Information Retrieval, Programming in C++, Advanced Technical Writing

- **King's Academy** — Madaba, Jordan
  High School Degree — AP Program, Honors Roll — *2017 - 2021*

  Completed all offered advanced math courses, including Multivariable Calculus, Number Theory, AP Statistics, and Linear Algebra.

Skills Summary

- **Languages**: Python, Java, C++, SQL, LaTeX, Racket (Lisp dialect), MATLAB, HTML/CSS, C, JavaScript
- **Tools**: Numpy, Pandas, Git, Pytorch, Tensorflow, Apache Spark, Hadoop, Plotly, Dash, Matplotlib, Jupyter, MySQL, SQLite, MongoDB, XPath, Azure
- **Concepts**: Neural Networks, Hyperparameter Tuning, Regularisation (dropout, L2), Gradient Descent (and momentum, RMSProp, Adam, etc), Transformers and Attention, Normalisation, Regression, Language Models, Chain-of-Thought Prompting, Fine-tuning, MapReduce, Data Visualisation, Classification, Clustering

Experience

- **Khoury College of Computer Sciences - Northeastern University** — Boston, US
  Research Assistant — *Aug 2022 - Present*
  - Assisting in Professor Huaizu Jiang's Visual Intelligence lab at Northeastern University.
  - Aiming to produce a model that can achieve visual commonsense reasoning abilities, which is the ability to answer commonsense questions regarding images.
  - Developed a system to quickly apply new prompt templates to QA datasets.
  - Evaluating new models, datasets, and methods from papers to see if they can benefit our needs.
  - Sampling new models' outputs on different prompts and writing scripts to speed up repetitive processes.
  - Submitted a paper to ACL regarding some of our findings in NLP areas of our research (under review).

- **Khoury College of Computer Sciences - Northeastern University** — Boston, US
  Teaching Assistant — *Jan 2022 - July 2022*
  - Mentored students for two semesters as a TA for the Fundamentals of CS course as a freshman.
  - Helped students in office hours, graded their work, and co-led labs in which they practiced new material.

- **Insan Wa Alat** — Amman, Jordan
  Software Development Intern — Back-end Development — *Summers Jun 2017 - Sep 2019*
  - Learned to use diverse technologies while working on various projects for different clients, including Azure, Android, and Enterprise Resource Planning (ERP) systems like Odoo.
  - Led the development of a mobile application that utilizes OCR technology to scan prepaid phone cards.

Projects

- **MarkovPatch: Random Image Masks for Attention-based Explainable AI** — *Fall 2022*
  - Applied image masks to a pre-trained classification neural network during inference to determine which spatial features are of significance.
  - Developed a random mask generator by sampling a second-order Markov chain. The distribution parameters were adjusted to alter the size and spatial correlation of the masks' patches.
  - Applying this method to a cat classifier, demonstrated that the model is paying more attention to contour features and specific feline attributes like ears and whiskers.
- **Assigning TAs to Labs Using Evolutionary Computing** — *Fall 2022*
  - Formulated the problem of assigning teaching assistants with different constraints to different lab sessions with more constraints as a cost optimisation problem.
  - Developed a program that applies evolutionary computing principles to search for the minimum-cost solution.
  - Wrote scoring functions to quantify progress and compare solutions, as well as agent functions that were randomly applied to solutions to "mutate" them into something that may be more desirable.
  - The method was able to reliably and quickly find the most optimal solutions.

Certifications

- **Deep Learning Specialisation**: Neural Networks and Deep Learning Fundamentals, Hyperparameter Tuning, Regularization and Optimization, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models. (Coursera online course)

Interests

- Running / Road Cycling / Star Wars / Skiing / Learning languages, mainly French