GEORGIOS MARGARITIS

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EDUCATION

Massachusetts Institute of Technology, 2021-Present
PhD Candidate in Operations Research

- **GPA 4.9/5.0:** Quantitative methods for Natural Language Processing, Machine Learning under a modern Optimization Lens, Linear Optimization, Integer Optimization, Statistical Learning, Fundamentals of Probability, Robust Optimization, Nonlinear Optimization

Technical University of Crete, 2016-2021
Diploma & Integrated M.Eng, in Electrical & Computer Engineering

- **GPA 9.9/10** (53 courses, 300 ECTS)
- **Valedictorian** - Highest diploma degree in the 30-year **recorded history** of the department.

PROFESSIONAL & RESEARCH EXPERIENCE

Google, June-August 2025
ML Intern – Google Cloud AI

- Implement and train 10+ recommendation models using state-of-the-art LLMs.
- Compare LLM-based recommenders against traditional models & production systems.
- Implement methods that can significantly improve cold-start recommendation performance.

NETFLIX, May-August 2024
ML Research Engineer Intern – Recommendation Algorithms

- Worked on improving Netflix's core recommendation algorithm.
- Implemented a multimodal recommendation pipeline using state-of-the-art LLMs, Vision Transformers and Contrastive Learning.
- Scaled the pipeline to production-size data and showed **3-5%** improvement in recommendation quality.

Massachusetts Institute of Technology, 2021-Present
Graduate Researcher – Advisor: Prof. D. Bertsimas

AI for Healthcare:

- Developed a flexible Multimodal ML/LLM pipeline that uses the Electronic Health Record (EHR) to predict **100s** of health-related outcomes (e.g. diabetes, hypertension) with at least **98%+** accuracy.
- Validated the pipeline in **3 different hospitals**, showing that it can reduce the data-collection burden as much as **55%**, potentially reducing costs by **millions** every year.
- Our pipeline has the approval of the Society of Thoracic Surgeons (STS) and aims to be deployed to **97% of U.S. cardiac programs** that collaborate with STS. (Presented in INFORMS '23-24 soon to be submitted top-tier medical journal).
- Additionally we worked on **Retrieval-Augmented Generation** (RAG) for enhancing **performance** and **interpretability** in clinical prediction tasks. We showed AUC improvements of **7%** on average in **5** multimodal diagnostic tasks using state-of-the-art LLMs (Preprint).

Efficient Embedding Adaptation for Healthcare:

- Proposed a method that can be used to adapt multimodal embeddings to a downstream task at a very low computational cost. The method is ideal for low-resource environments, such as hospitals.
- Method uses contrastive learning and was tested on **real-world clinical data**, showing significant improvements with very low computational cost (Preprint)

ML for Global Optimization:

- Created a solver that solves constrainted **convex, non-convex** and **black-box** problems.
- Our solver can solve much more general problems than most commercial & literature solvers.
- The solver uses **ML models** to learn the Objective and Constraints from samples, and then embeds the models as surrogates in a **Mixed-Integer Optimization** problem.
- The solver outperforms commercial solvers such as **BARON** or **Gurobi** in various non-convex problems from literature (Publication).

Solving Robust Optimization with LLMs:

- We use LLMs and in-context learning to formulate and solve Robust Optimization Problems.
- The trained LLM applies theorems to produce the computationally tractable Robust Counterpart.
- The LLM finally produces executable Julia code that solves the problem (Preprint).

an-edtiorial.com, 2021 – 2023
ML/Software Engineer & CTO,

- Created Deep Learning pipeline for finding similar products from images and text (scales to 300k products).
- Implemented a personalized multimodal product recommendation system using Computer Vision & NLP.
- Full-stack development of the website, including product recommendations, product pages, search & multi-attribute filtering on 300k+ products (Wordpress, Python, PHP, Javascript, MongoDB, MySQL).

Technical University of Crete, Undergraduate Researcher 2020-2021
SOFTNET – Laboratory of Prof. Minos Garofalakis

- Diploma Thesis**: "Differentially-Private Data Synthesis using Variational Autoencoders"**
- Proposed a method with which **100s of hospitals** can collaborate to produce a rich synthetic dataset in a privacy-preserving way.
- The method combines Federated Learning, Differential Privacy and Variational Autoencoders and mathematically ensures that the privacy of the data-owners is respected (Link).

Foundation of Research and Technology Hellas, Research Intern June-Sept 2019
Computer Vision & Robotics Lab – Laboratory of Prof. Panos Trachanias

- Involved in the project "**Human Behavioral Profiling**" in collaboration with Honda Research of Japan.
- Used Dynamic Motion Models and Reinforcement Learning to make a robotic arm imitate human tasks.
- Simulated and implemented the resulting kinetic models using Python, C++ and ROS.

GUESTFLIP P.C. Dec 2017 – Feb 2019
ML/Software Engineer & Co-Founder,

- Developed an NLP system that analyzes hotel reviews, detects polarity, and identifies guests' complaints.
- The system suggests responses to the review depending on the sentiment and the type of complaint.
- Full-stack web development of the company's web platform in Laravel-PHP.

TEACHING EXPERIENCE

Massachusetts Institute of Technology, 2023

- **Instructor** for sessions on "Natural Language Processing" and "Distributed Computing" (2024).
- **T.A.** for "Hands-On Deep Learning" and "Machine Learning Under a Modern Optimization Lens" (2023).

Technical University of Crete,

- **Instructor** for sessions on Competitive Programming in the IEEE Student Chapter (2019-2020).
- **T.A.** for Introduction to Calculus (2017-2019).

SELECT HONORS – ACHIEVMENTS - ACTIVITIES

- Award from the **MIT ORC** for the **best performing NLP model** in an MIT competition (2022).
- Award & scholarship from the **Greek Government** for **highest Diploma GPA** in my school (2021).
- Place in the top **1.2%** of teams in the international programming competition "**Google Hashcode**" (2020).
- Place **125** among **3,700** teams in the international programming marathon "**IEEEXtreme**" (2020).
- Awards in the Greek national student competitions of **Chemistry** and **Physics** (2016).
- Award for ranking among **top 15** students in the **Greek National Olympiad of Informatics.**
- **Third place** in Greece in the Team Chess Championship (2016).
- Qualification in the last national round of the **European Union Science Olympiad** (**EUSO**) (2014).
- Qualification and participation in the **28th National Mathematical Olympiad** "**Archimedes**" (2012).

ADDITIONAL INFORMATION

- **Programming Languages:** Python, Julia, Javascript, MATLAB, C, C++, SQL, PHP, Scala
- **Tools & Frameworks:** Tensorflow, Pytorch, JuMP, Spark
- **Areas of Expertise:** Machine Learning, Deep Learning, NLP, Optimization, Software Engineering
- **Volunteering/Leadership:** President of the Hellenic Student Association of MIT, organizing cultural events attended by **100s** of people (2023).