

# Alexandros Xiarchos

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## EDUCATION

### University of Patras

Apr 2025

*5-year Integrated Master's in Computer Engineering & Informatics (CEID)*

## PROJECTS

### Thesis: Task Management App using Mendix | *Low-Code, Domain Model, UI/UX*

- Built and deployed a task management application on Mendix low-code platform, supporting multi-user access and custom role-based authentication.
- Designed domain models, structured entity relationships and implemented microflows to automate processes, user interactions and manage database operations.
- Achieved 83.6 SUS score after usability testing with 23 users, indicating high usability and intuitive UI/UX.

### Information Retrieval System | *Python, NumPy, Matplotlib, VSM, ColBERT*

- Engineered a medical search engine using TF-IDF and ColBERT models, enabling scalable semantic and lexical retrieval across 1k+ clinical documents with medical terms.
- Built inverted index with cosine similarity scoring; implemented NLTK pipelines for stopword removal, stemming, tokenization; integrated pre-trained ColBERT model for semantic ranking in Google Colab.
- Evaluated performance with Precision-Recall curves and Mean Average Precision, visualized with Matplotlib.

### Multi-Dimensional Data Indexing & Search System | *Python, LSH, pandas, NumPy*

- Developed a multi-index search engine supporting range and similarity queries using K-d Trees, Quad Trees, Range Trees, and R-trees for indexing through computer scientist profiles based on surname and awards.
- Parsed and cleaned structured Wikipedia data using BeautifulSoup; generated CSV datasets containing affiliations, education history, and publication metadata.
- Implemented MinHash-based LSH with Jaccard similarity to compare academic background; benchmarked structure performance on 200 simulated range queries.

### Human Activity Classification & Clustering System | *pandas, Matplotlib, KMeans, Neural Networks*

- Built a machine learning pipeline for HARTH sensor data to classify human activities using Neural Networks, Random Forests, and Bayesian classifiers across 6+ movement types.
- Performed preprocessing and noise filtering using pandas; visualized feature distributions, correlations and label patterns with Matplotlib plots.
- Achieved strong classification performance using accuracy, precision, recall, and F1-score; applied PCA, KMeans, and DBSCAN for activity clustering.

### Disaster Management Web Platform | *JavaScript, PHP, JQuery, SQL, Tailwind*

- Developed a real-time disaster response platform using PHP, JavaScript, jQuery, and SQL to coordinate emergency aid, user reports, and logistics flow.
- Enhanced frontend with Tailwind CSS and Leaflet-based interactive maps; integrated sweetalert2 modals and Chart.js for live data visualization.

## EXPERIENCE

### Web Developer

May 2023 – Apr. 2024

*Hygieia Spin Off Scientific Research & Educational Cluster*

*Part-time Volunteering*

- Refactored insecure WordPress PHP codebase, reducing load time and patching vulnerabilities; provided ongoing bugfix support and UI enhancements.

### Teaching Assistant – Basic & Digital Electronics Lab

2019 – 2020, 2022 – 2023

*University Of Patras*

*On-site*

- Led lab sessions for 100+ students across 4 semesters; graded circuit experiments, troubleshoot hardware failures, streamlined equipment setup process while collaborating effectively with professors and fellow teaching assistants.

## SKILLS

**Languages:** Python, Java, C, C++, SQL, JavaScript, PHP

**Data & ML:** NumPy, pandas, SciPy, Matplotlib, scikit-learn, K-Means, BeautifulSoup

**Web Development:** React, Tailwind CSS, jQuery, Leaflet, Chart.js

**Tools:** Git, Mendix, Docker, Google Colab