Alexandros Xiarchos

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Education

University of Patras Expected Apr. 2025
Integrated MEng in Computer Engineering & Informatics (CEID) *Grade: 7.7/10*

Projects

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

- Developed a scalable task management application using the Mendix low-code platform, deployed on a cloud environment with custom UI/UX components.
- Designed domain models, structured entity relationships and implemented microflows to automate processes, user interactions and manage database operations.
- Implemented role-based authentication for secure multi-user access, supporting administrators and standard users.
- Conducted a System Usability Scale (SUS) evaluation with 23 users, achieving an 83.59 mean score, indicating high usability.

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

- Developed a search engine for retrieving medical information from a collection using multiple retrieval models.
- Implemented text preprocessing pipelines (stopword removal, stemming) using NLTK, followed by a Vector Space Model with TF-IDF weighting, leveraging a custom inverted index and cosine similarity for ranking.
- Integrated a ColBERT model in Google Colab, adapting a pre-trained transformer for semantic ranking.
- Evaluated performance with Precision-Recall curves and Mean Average Precision, visualized with Matplotlib.

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

- Implemented multi-dimensional data structures (K-d Trees, Quad Trees, Range Trees, and R-trees) for indexing and searching through computer scientist profiles based on surname and awards.
- Extracted and preprocessed structured data from Wikipedia using BeautifulSoup, storing it in CSV format.
- Created an LSH-based search algorithm using MinHashing & Jaccard similarity to compare scientists' education.
- Benchmarked performance of data structures for range queries and similarity searches.

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

- Developed a data mining project using Python, focusing on human activity recognition from sensor data.
- Performed data preprocessing on a HARTH dataset, identifying and handling inconsistencies using pandas and visualized distributions and correlations with Matplotlib.
- Implemented and compared Neural Networks, Random Forest, and Bayesian Networks for activity classification, analyzing accuracy, precision, recall, and F1-score.
- Applied KMeans and DBSCAN clustering to group activity patterns, using PCA for dimensionality reduction.

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

- Built a web-based platform for emergency aid coordination, enabling real-time requests and logistics tracking.
- Developed using JavaScript, PHP, jQuery and AJAX for server-side interactions, with front-end enhancements utilizing Leaflet for interactive maps, Tailwind CSS for responsive design, sweetalert2 for user popup notifications, and Chart.js for statistic data visualization.

Experience

Web Developer May 2023 – Apr. 2024
Hygieia Spin Off Scientific Research & Educational Cluster *Part-time Volunteering*

- Fixed PHP issues in WordPress, improving performance & security while providing on-demand technical support.

Teaching Assistant – Basic & Digital Electronics Lab 2019 – 2020, 2022 – 2023
University Of Patras *On-site*

- Taught over 100 students the proper use of lab equipment, evaluated their exercises, and troubleshot issues, collaborating with professors and fellow teaching assistants to ensure smooth lab operations.

Skills

Languages: Python, Java, C, C++, SQL, JavaScript, PHP, Assembly, MATLAB
Frameworks/Tools: Mendix, Git, VSCode, PyCharm, IntelliJ
Data Analysis & Machine Learning: NumPy, SciPy, pandas, Matplotlib