Research Experience through Courses

Spring 2022 ***Deep Learning and Its Applications,*** *University of Thessaly, Greece*

This course offers a thorough exploration of deep learning, including topics like deep sequential learning, CNNs, and generative models. It introduces reinforcement learning and deep reinforcement learning and explores practical applications in recommendation systems. Regarding the research project, I was tasked with a detailed examination of the article titled *"Neural Collaborative Filtering",* where my responsibility entailed summarizing the algorithms employed within the study and also I was required to utilize the NeuMF methodology using a specified dataset, followed by conducting comprehensive statistical analysis on the obtained results. This endeavor was particularly engaging as it necessitated the parameterization of the source code, specifically in TensorFlow, to ensure its compatibility with the provided dataset.

Spring 2022 ***Data Mining,*** *University of Thessaly, Greece*

This course offers an introductory overview of Data Mining, encompassing Data Preparation, Basic Concepts, and Data Mining System Architectures. Topics covered include the mining of association rules from large datasets, classification problems, and prediction techniques. Regarding the project, I worked with a provided dataset, performing data analysis and experimenting with approximately ten distinct machine learning models to determine the most suitable one for integration into the final application. Subsequently, I developed a Python-based desktop application featuring a user-friendly interface. This application enables users to input data and obtain predictions based on the previously trained machine learning model.

Spring 2022 ***Advanced Data Management,*** *University of Thessaly, Greece*

In this course, we undertook both a research project and a practical assignment. The research project focused on "Real-Time Data Management," involving literature review, technique evaluation, and comparisons. The practical assignment involved the development of a fully functional web application for file storage using MongoDB, accessible to registered users for CRUD (Create-Read-Update-Delete) operations.

Fall 2021 ***Concurrent Programming,*** *University of Thessaly, Greece*

The course primarily covered concurrent programming principles in C, emphasizing synchronization techniques. Practical assignments and experiments included solving concurrency problems using semaphores, mutexes, conditional variables, and implementing a Conditional Critical Region mechanism. I also developed a user-level threads framework for better thread management.

Spring 2021 ***Operating Systems,*** *University of Thessaly, Greece*

The course involved practical assignments and experiments with the Linux kernel, contributing code and improving the operating system. Tasks included system calls, CPU scheduling, and memory management. Specific assignments included implementing the Shortest Job First (SJF) scheduling algorithm, modifying the SLOB (simple list of blocks) allocator, and creating a filesystem with FUSE (Filesystem in USErpsace). These tasks underwent rigorous performance evaluation and statistical analysis.

Fall 2020 ***Computer System Organization,*** *University of Thessaly, Greece*

This class is a hardware-oriented one where my team designed a five-stage pipelined MIPS CPU in Verilog with all the required parts of a CPU such as ALU, Regfile, Branch Prediction mechanism etc. The development of the MIPS CPU was a gradual process, systematically advancing through weekly labs. Furthermore, the practical aspect extended to the evaluation of algorithms through dedicated testbenches. This evaluation encompassed an in-depth analysis of performance metrics, particularly centered on machine cycles and other relevant benchmarks.