

# Spyridon Liaskonis

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## EDUCATION

2020 - Present    Diploma (5 years) in ELECTRICAL AND COMPUTER ENGINEERING  
University of Thessaly, Volos, Greece

## RESEARCH INTERESTS

High-Performance Computing, Hardware Accelerators, Embedded Systems, Computer Architecture, Operating Systems, Deep Learning.

## SKILLS

- **Programming Languages , Libraries:** C, C++, Python, CUDA, OpenMP, OpenMPI, Verilog, HLS C/C++, MATLAB, NumPy, Matplotlib
- **Tools:** git, make, PyTorch, TensorFlow, Xilinx Vitis HLS, Xilinx Vivado, Intel Vtune Profiler, Intel Advisor, LaTeX, Linux, Bash, ONNX

## SELECTED ACADEMIC COURSES - PROJECTS

**ECE 429 Special Topic: Reinforcement Learning-driven Bitwidth Optimization for Neural Network Quantization on FPGAs (Ongoing)**    *Technologies:* FINN, PyTorch, Brevitas, Gymnasium, PetaLinux

- Developed RL reward functions for optimizing neural network quantization for FPGAs.
- Expanded framework support for various FPGA platforms.
- Tested and validated framework on various network architectures.
- Deployed the framework's quantized networks on various platforms, including the [Alveo U250](#) and [ZCU 102](#) and analyzed their performance.

**ECE 340: Embedded Systems**

*Technologies:* C, OpenCL, Verilog, Vivado, Vitis HLS, PetaLinux

- Hardware acceleration of the Smith-Waterman Local Sequence Alignment algorithm for Genomics using the Vitis High-Level Synthesis toolset, on a low-power FPGA MPSoC.
- Performance measurement of bare-metal embedded software on an ARM processor.
- IEEE 754 compatible Floating-Point Adder in Verilog on an FPGA.

 [Project Repository](#)

**ECE 415: High-Performance Computing**

*Technologies:* C, CUDA, OpenMP

- Parallel implementation of a Sobel Filter with OpenMP.
- GPU acceleration of a separable convolution kernel with CUDA.
- GPU acceleration of a histogram equalization algorithm with CUDA.
- CPU/GPU acceleration of an N-body simulation with OpenMP/CUDA.

 [Project Repository](#)

**ECE494: Processor Design**

*Technologies:* FINN, PyTorch, Brevitas, ONNX

- Hardware acceleration of Quantized Deep Neural Networks on FPGAs using the FINN compiler by Xilinx
- Evaluation of several levels of quantization and the effects on accuracy, performance, and resource utilization.

**ECE 445: Parallel & Distributed Computing**

*Technologies:* C, OpenMP, OpenMPI

- Designed and implemented parallel algorithms for matrix multiplication and the Jacobi method using OpenMP, focusing on thread distribution, scheduling, and performance optimization.
- Designed and implemented parallel algorithms for calculating communication costs in a distributed system, using MPI to measure point-to-point and broadcast communication times, and optimizing performance for matrix-vector multiplication and sorting algorithms.

 [Project Repository](#)

**ECE 513: Circuit Simulation Algorithms**

*Technologies:* C++, FLEX, Bison, Eigen, CMAKE

- Developed a complete circuit simulation program like SPICE in C++.
- Implemented parsing, equation formulation, and solution techniques (direct and iterative methods) for linear circuits.
- Utilized sparse matrix techniques and external libraries (Eigen) for efficient computation.
- Performed transient analysis to simulate circuit behavior over time.

 [Project Repository](#)

## ECE 447: Neuro-Fuzzy Computing

*Technologies:* PyTorch, NLTK

- Fine-tuned the BERT architecture for news classification
- Applied data preprocessing using NLTK.
- Trained and evaluated the model using PyTorch, optimizing performance through hyperparameter tuning.

## ECE 318: Operating Systems

*Technologies:* Linux

- Benchmarking alternatives of Shortest-Job First (SJF) on a VM that emulates the API of the Linux scheduler.
- Implementation of a user-space file system based on FUSE with support for basic file operations.
- Modifying the SLOB memory allocator to use the First-fit algorithm for both page and block allocation.

## ECE 333: Digital Systems Lab

*Technologies:* Verilog, Xilinx Vivado

- A 7-Segment Display Driver to display a scrolling message.
- A UART serial communication system.
- A VGA driver used to drive a conventional monitor and depict a variety of images.

 [Project Repository](#)

## ECE 340: Concurrent Programming

*Technologies:* C, PThreads

- Implemented a coroutine-based system for concurrent code execution with explicit switching, using functions to manage execution contexts. Extended the implementation to support concurrent execution with threads using automatic switching via an alarm/timer and a round-robin scheduling policy.
- Implementation of many concurrent algorithms in C/Java using Semaphores/Monitors.

 [Project Repository](#)

## VOLUNTARY WORK/EXTRA CURRICULARS

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- Teaching Assistant for ECE219: Computer Organization and Design (September 2024- Present)  
Examination of laboratory assignments on MIPS assembly programming, Verilog implementation of a MIPS CPU, and performance analysis and optimization of computationally intensive algorithms on x86 CPUs.  
Reference: [Prof. Nikolaos Bellas](#)
- Teaching Assistant for ECE220: Numerical Analysis (February 2025 - Present)  
Assisted students in teaching lab sessions for a course covering key topics in numerical analysis and the application of numerical methods using MATLAB.  
Reference: [Prof. Panagiota Tsompanopoulou](#)

## LANGUAGES

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**English:** Professional Working Proficiency (ECCE Certification)

**Greek:** Native Speaker