Mohammad Dika

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Education

American University of Science and Technology — Beirut, Lebanon
M.S. in Computer and Communications Engineering with major Emphasis in Mechatronics Engineering. — *From October 2019 To June 2021*
GPA 4.0/4.0

American University of Science and Technology — Beirut, Lebanon
B.S. in Computer and Communications Engineering with major Emphasis in Mechatronics Engineering. — *From October 2015 To June 2019*
GPA 3.8/4.0

Baccalaureate II — *Beirut, Lebanon*
Official Baccalaureate certificate. — *June 2015*
73/100

Teaching Experience
From 2020 To Present

Undergraduate Courses

Dynamics — *October 2022*
Main instructor for the Dynamics course. Topics include:
The study of a particle in motion, kinetics, and kinematics.
The study of collisions in a system of particles. Study of conservation of momentum, impulse, and energy.
The study of kinetics and kinematics of a rigid body in three-dimensional space.

Computer Organization and Microprocessors — *June 2022*
Main Instructor for the Computer Organization and Microprocessors course. Topics include:

- Architecture of Microprocessors and Microcontrollers
- Communication techniques between hardware and software
- Assembly Language for x86, ARM and microcontrollers
- Performance Enhancing Techniques for microprocessors

Computer Aided Design *March 2023*

Main instructor for the Computer Aided Design. Topics include:

- Designing of parts in Autodesk Inventor
- Designing Assemblies in Autodesk Inventor
- Creating Drawing files and assembly instructions
- Calculating and implementing Stress Analysis

Undergraduate Labs

Circuit Analysis I Lab *June 2020*

Lab instructor of the Circuit Analysis I lab.

Topics Covered:

- Basic Implementation Skillset such as project boards and passive components
- Applying passive components such as Resistors, Capacitors, and coils.
- Creating RLC circuits
- Covering Operational Amplifiers

Sample of Projects Covered:

- Voltage level indicators such as water level indicators and visualizers.
- Smart irrigation systems for smart gardens
- Light and line followers

Circuit Analysis II Lab *June 2020*

Lab instructor of the Circuit Analysis II lab.

Topics Covered:

- Linear Op-Amp applications such as inverting and non-inverting and summing amplifiers
- Non-Linear Op-Amp applications such as comparators, peak detectors, integrators, clampers and so on.
- Designing first order and second order passive filters using RC components
- Designing active filters using op-amps such as Sallen-key filters

Sample of Projects Covered:

- Music Visualizer and Equalizer
- Music Tone Control
- Guitar Tuner through Frequency Detection

Computer Organization and Microprocessors Lab *June 2021*

Lab instructor of the Computer Organization and Microprocessors lab.

Topics Covered:

- Microcontroller Choosing depending on application
- Arduino Programming

- Digital Reading and Writing
- ADC and PWM implementation
- Serial communication through Bluetooth or USB

Sample of Projects Covered:

- Smart Irrigation System
- Chess Playing Robot
- Hexapod
- Advanced Guitar Tuner
- Smart Home
- Smart Espresso Machine
- 3D Display through Rotating LEDs

Robotics Lab *October 2020*

Lab instructor of the Robotics lab.

Topics Covered:

- Introduction to ROS2, and how to implement ROS2 to control multiple robots
- MATLAB Robotics Toolbox Introduction including all of the necessary kinematic and inverse kinematic calculations
- Motion planning and trajectory calculation using Robotics toolbox
- Hardware simulation using Coppeliasim and the LUA language

Sample of Projects Covered:

- Chess playing Robotic Arm
- Shape Drawing Robotic Arms
- Pyramid Creating Robotic Arm
- Guess-The-Cup Game Robotic Arm

Mechatronics Lab *October 2020*

Lab instructor of the Mechatronics lab.

Topics Covered:

- How to design and approach the designing of mechatronic systems using PIC and C language
- How to design and approach the designing of mechatronic systems using PLC and Ladder Diagrams

Sample of Projects Covered:

- Planting Robot
- Automated Car Washing System
- Smart Sun Follower

Control Systems Lab *June 2020*

Lab instructor of the Control Systems lab.

Topics Covered:

- Using MATLAB to learn how to design mathematical models
- Learning multiple control techniques like Root Locus and PID Control

Sample of Projects Covered:

- Self-Balancing Robot
- Three-Dimensional Gimbal
- Magnetic Ball Levitation

Advising Experience

Undergraduate Senior Teams

FireBeats *From October 2020 To June 2021*

Project aimed to create an entertaining light show by controlling multiple fire outlets through the frequency of music, while also incorporating a passthrough for the heat to work as a heater in the winter as well

OP-EYE *From October 2022 To June 2023*

Project aimed to simplify the process of testing one's eyesight for optometrists by automating the manual eye test into a single, automated tester with an online database and on-machine calculation for the results

Academic Activities

Robotics Coding Course for School Students *From January 2023 To May 2023*

Planned and designed a Python coding course for school students to attend
Roles included:

- Writing the manual for the course and preparing all the codes and material
- Gave 2 of the 10 classes given over a period of 4 months
- Handled all the assistants which were university students and coordinated between all the classes

Robotics Summer Camp *July 2023*

Planned and designed a Robotics Summer Camp about Arduino programming themed around Formula One for school students to attend
Roles included:

- Writing the manual for the course and preparing all the codes and material, including the designing of the racetrack.
- Gave 2 of the 10 classes given over a period of 4 months
- Handled all the assistants which were university students and coordinated between all the classes

Jury Member *From June 2020 To Present*

Jury member for all Project Design Lab and Senior expositions where students either present course-specific projects or senior projects and evaluate them accordingly.

ABET Evaluation *June 2021 To Present*

Assist in the Student Evaluation criteria for the ABET assessment in choosing which courses as well as selecting which problems, which criteria to evaluate accordingly.

Publications

M.Dika, M. Owayjan, R. Achkar, "*Steering Control of Self-Driving Car Using Super-Twisting Sliding Mode Control*", ACTEA 2023. *July 2023*

Awards

President's Award *June 2019*

Awarded for the students graduating with High Distinction

LabVIEW Associate Developer *From January 2017 To January 2019*

Awarded Certificate for passing the LabVIEW Developer Exam

NXP CUP MENA Winners *June 2021*

Winners of the regional NXP Cup competition where teams compete to get the fastest time on an autonomous track competing car.

Skills

Language: Fluent in English, Arabic, Moderate in French and German
Computer: Autodesk Inventor, MATLAB&SIMULINK, LabVIEW, ROS2, Proteus, Multisim, C language, C++ language, Python Language, LUA language, PLC Programming, Assembly Language

References

Dr. Roger Achkar
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