MUHAMMAD HARIS

Address: Flat no 24, Jinnah Apartments, Baldia coloni, Hyderabad, Pakistan
Cell no.#: +923003278535
Email: harisnadeemy97@gmail.com
Linkedin: muhammad-haris-883492145

EDUCATION

- **Master of Engineering**, Electrical and Computer Engineering | McMaster University, Canada 2020-2022
- **Bachelor of Science**, Major in Electrical Engineering, Minor in Mathematics | Habib University, Pakistan 2016-2020
  - **CGPA**: 3.90/4.0
  - **Entrance scholarship** on four year tuition fee: 80%
  - **Awards**
    * Dean's Medal | Habib University 2020
      For graduating with highest CGPA in class
    * Best interdisciplinary Design Project Award | Virtual Self Defence Trainer 2020
    * Undergraduate Research Achievement Award | Image Processing Techniques for Fast and Accurate Estimation of Pose of a Double Pendulum 2020
      Awarded a research grant of €280
    * Dean's List | Habib University
      Throughout six semesters
    * President's List | Habib University
      Throughout three years
  - **Notable Courses**: Computer Vision, Introduction to Robotics, Mobile Robotics, Digital Image Processing, Engineering Design & Innovation, Micro-controllers & Interfacing, Principles of Feedback & Control, Mathematical Methods for physics, Geometric Modelling, Advanced Differential Equations and Computational Thinking
- **Cambridge Ordinary & Advanced Level** | GCSE 2012-2016
  - **A' Levels**: 2 A*'s and 1 A's
  - **O' Levels**: 6 A*'s and 6 A's

CONFERENCES & PUBLICATIONS

- **Virtual Self Defense Trainer - Analyzing and Scoring User Pose** | 2nd International Congress on Human-Computer Interaction, Optimization and Robotic Applications June 2020
  - Indexed in IEEE digital Library | DOI: 10.1109/HORA49412.2020.9152860
  - Processed human pose, captured via webcam and used openpose, to extract features.
  - Constructed a dynamic time warping framework, ran it on two video sequences to get a frame to frame correspondence
  - Compared frames and gave a numerical score & feedback in natural language.
- **Image Processing Techniques for fast and accurate Estimation of Pose of a Double Pendulum** | 14th International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing May 2020
  - Indexed in IADIS digital Library
  - Compared image processing techniques to estimate the pose of a double pendulum, based on the accuracy offered with the reference method and the speed of computation. At best a simple method yielded 600 fps on a CPU.

PROJECTS

- **Crash Prediction** | Computer Vision Spring 2020
  - Developed a traffic accident prediction framework which detects and tracks vehicles in a CCTV perspective.
- **Simulating Punch in the Virtual Environment** | Capstone I Fall 2019
  - Built a setup that gave Haptic tactile sensation and locked the arm of the user, to prevent it from penetrating into the virtual wall, when it punched a virtual wall, using controlled Electric Muscle Stimulation.
- **Child Health Monitoring Device** | Engineering Design and Innovation Spring 2019
  - Constructed a low cost health monitoring device to track crucial vital signs of children who are alone at home or under the care of unskilled caretakers.
  - Our device alerts caretakers and the nearest hospital in case of an emergency.
  - I contributed to the interfacing of MPU6050 Accelerometer+Gyroscope and pulse sensor with NodeMCU IoT board.
- **Self Balancing Robot** | Principles of Feedback Control Fall 2018

- Developed a self Balancing two wheeled mobile robot to capture the famous inverted pendulum problem.
- Designed a PID controller on an Arduino.
- I collaborated in the coding of the PID controller.

- **Self localizing Robot** | Micro-controllers and Interfacing Spring 2018
  - Constructed a two wheeled mobile robot that localized and moved in a grid arena using color and Infra Red sensors and dropped balls at specific sites.
  - I contributed in the design of the physical structure, worked on programming the ball dropping mechanism, calibrating the color sensors and worked to some extent on localizing.

WORK EXPERIENCE

- **Teaching Assistant** | Habib University Fall 2017 - Fall 2019
  - Was a TA for the courses: Engineering Mathematics, Probability & Statistics, Electric Circuit Analysis, Electric Network Analysis and Calculus II.
  - Prepared and graded assignments.
  - Conducted recitation sessions for students.
- **Academic Assistant** | SolvenEvolve June 2018 - January 2019
  Managed online courses by designing and uploading problem sets and video lectures for complex calculus and advance differential equations.

VOLUNTEER EXPERIENCE

- **Programming workshops**
  - Moderated "Introduction to python workshop", a workshop by McMaster Engineering Graduate Society and DASH at McMaster University Fall 2020
  - Conducted LaTeX and MATLAB workshops by EHSAS at Habib University Spring 2020
- **Mentor** 2018
  Mentored a freshman year student, adjusting to university life.
- **Deputy Chairman Finance Department** | Habib University Debating Championship Fall 2016
  Managed budget and financed event.
- **Assistant Committee Director** | Habib University Model United Nations 2017
  - Created study guides for United Nations Security Council committee
  - Moderated and assisted delegates with technical advice, providing them ideas for crises and the means of implementing them.
- **Workshop for A Levels Physics Practicals** | Rockford Cambridge School 2017
  - Conducted a workshop to brief the students about examinations and experiments.

LANGUAGES

Fluent English (IELTS: 7.5), Urdu and Sindhi
Basic Japanese

HARDWARE AND SOFTWARE SKILLS

Programming languages	MATLAB, Python, C and C++
Typesets	Latex and MS Word
Simulation Environments	MATLAB+Simulink, LabView and OrCad Pspice
Controllers	Programmable Logic Controllers, Arduino and NodeMCU
Pose Estimation Libraries	OpenPose and PoseNet

INTERESTS

- Cooking, swimming, sketching, anime, and table tennis