Nilay SHETH
Embedded | Control Systems

🌐 nilay994.github.io
@ nilay_994@hotmail.com
in linkedin.com/in/legorative

📍 Delft, Netherlands
⚓ Embedded systems at fuel cell tech
📱 +31 616 948 132

💼 PROFESSIONAL EXPERIENCE

zepp solutions
Feb2021-current

EMBEDDED SYSTEMS ENGINEER
> Firmware for the Engine Control Units (ECU) of zepp solutions, a hydrogen fuel-cell company.
> Filtering sensor data, control of actuators and detecting failure modes in the fuel cell system.

CANbus | J1939 | IEC61508 | unit testing and modeling | MISRA

MAVLab Delft
AlphaPilot
Lockheed Martin
Jan2019-Jan2021

CONTROL AND EMBEDDED TEAM, AEROSPACE FACULTY, TU DELFT
> Finished as world champions at AIRR amongst 432 research teams, with a prize of $1M ☑ (highlights).
> AlphaPilot ☑ AI Robotic Racing (AIRR) is about autonomous racing against human pilots and was mentored by experts from Lockheed Martin, Drone Racing League and MIT's Aerospace lab.
> Designed the race drone's state estimation, control and trajectory planning pipeline.
> Firmware for ☑ PercEvite, Sense-and-Avoid air traffic control (European Single-Skies initiative).

Matlab/Python | C/C++ | ESP32 | PPRZ UAV | HiL | ROS | multithreading | computer vision | linux-preemptRT

Espressif Systems, Shanghai
Jul2016-Aug2017

FIRMWARE DEVELOPER | APPLICATIONS ENGINEERING
> Added Linear Algebra (LAPACK) and FFT support, MIPS and FLOPS profiling for matrix inversion.
> Developed parts of the famous ☑ esp-idf alongwith Amazon Web Services for embedded platforms.
> Audio Processing for Speech Analysis using Fixed point arithmetic on ESP-32's Tensilica Processor.
> Designed motor control drivers: BLDC/brushed/servo and I2C/SPI drivers for LCDs for HMI applications.

Embedded C | FreeRTOS | ESP32 | ESP8266 | esp-idf | Matlab | git

FIRST Robotics, Sydney
Jan2015-Mar2016

TEAM MENTOR FRC-6024 | CONTROL SYSTEMS
> Layed out the control system and drive-train over the CAN bus of NI-Rio (credits to WPI-lib).
> Mentored India's debut FRC team to finish in the top 10 of Australian regionals.

NI-RoboRio | labview | C++/java

ABU Robocon, Asia Pacific region
Nov2013-Mar2016

TEAM CAPTAIN ABU-ROBOCON | SECRETARY, ROBOTICS AND AUTOMATION CHAPTER VJTI
> Competition for prototyping mechatronic systems addressing novel problem statements in robotics.
> Quarter-Finalist at Robocon 2016, Semi-Finalist at Robocon 2014: promoting VJTI to internationals.
> Represented India at the International ABU-RoboCon, winning the Panasonic Award for Innovation.

Embedded C | AtMega1280 | motor driver designs | harness management | motor control

🎓 ACADEMICS AND CO-CURRICULARS

TU Delft, Netherlands
Aug 2017-Sep2019

MASTERS IN CONTROL AND EMBEDDED SYSTEMS
> Satellite Orbit Determination: GPS, non linear least squares, orbit dynamics, tracking and prediction.
> Implemented detumbling on the ☑ Attitude Control subsystem of Delft's PocketCube satellite.
> Magnetometer & IMU calibration, closed loop attitude control laws over Hardware in Loop (HIL) tests.
> Networked & Distributed Control: convex optimization, sampling + synchronization algorithms.
> Vehicle Dynamics: ABS, path planning algorithms, localization with Particle Filters.

Veermata Jijabai Technological Institute (VJTI)
Aug2012-May2016

BACHELOR OF TECHNOLOGY IN ELECTRONICS ENGINEERING
> Graded 'A+' on Bachelor thesis on ☑ Swarm Robots in Closed Loop Visual Odometry system, using Li-Fi.
> Product ideas: ☑ Hybrid HID ARM Cortex and wrist-watch multimeter at Texas Instruments Challenge.
> Designed a line following and grid solving robot winning at TechFest 2014, IIT-Bombay.
> Undertook workshops on embedded robotics for 300+ students around Mumbai (ARM, AVR, ESP32).
> MIT Media Labs DI: Open Sourced and prototyped a ☑ wrist band for taking 360°panoramas.
> numerical techniques, applied math, digital signal processing, op-amps and filters, VLSI design.

📖 PUBLICATIONS

Dec 2019	Our work on drone racing is featured at ☑ Business Insider ☑ Wired ☑ Bloomberg ☑ TU Delft ☑ BBC.
Sept 2019	Study during M.Sc., ☑ Thesis on state estimation and optimal control for racing drones.
Sept 2017	Published in Advances in Intelligent Systems and Computing (Springer, Germany) on ☑ LiFi Swarm Robots.
Dec 2015	Published ☑ MOSFET based motor drivers with closed loop control at the 12th International IEEE Conference, Indicon.
Jun 2015	Hindustan Times, India: Tech students engineer fixes for health-care issues: reference: SRA, VJTI.
Aug 2014	NHK Japan, Hindustan Times, Times of India: City College VJTI representing India internationally, ref-RoboCon 2014.

🔧 SKILLS

⚞	Programming	Embedded C, C++, FreeRTOS, Keil, MATLAB, Python,Labview, OpenCV, ROS, multi-threading.
⚙	Controls	LAPACK for uCs, HiL tests, Adaptive control laws, Kalman and RANSAC filtering, system identification.
⎇	Embedded	STM32, MSP432, ESP32, closed loop motor-control, NI-Rio, Multisim, KiCad, oscilloscope, soldering.
🖥	Softwares	Git-scm, Eclipse, Photoshop, CorelDraw, Latex.
🌐	Languages	English (fluent), Hindi (fluent), Mandarin (limited proficiency).