Nilay SHETH
Embedded | Control Systems

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💼 PROFESSIONAL EXPERIENCE

zepp solutions Feb2021-current	**EMBEDDED SOFTWARE ENGINEER | CONTROL AND SOFTWARE TEAM** › Firmware for the Engine Control Units (ECU) of zepp solutions, a hydrogen fuel-cell company. › Filtering sensor data, implementing Kalman observers, controlling various automotive valves and pumps. › Detection of various failure modes, facilitating a dashboard visualizing key-metrics of the system. › Customized µC abstraction layers, low level interface drivers for µC of zepp ECU. `MISRA C` `Safety critical software` `fault detection` `ISO26262` `J1939` `CAN` `Jenkins-CI` `Infineon AURIX` `ARM Cortex`
MAVLab Delft **AlphaPilot** Lockheed Martin Jan2019-Jan2021	**CONTROL AND EMBEDDED ENGINEER | DRONE LAB, TU DELFT AEROSPACE** › 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` `UAV` `HiL` `ROS` `threading` `computer-vision` `linux-preemptive RT`
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 ↗ esp-idf alongwith Amazon Web Services for embedded platforms. › Audio Processing for Speech Analysis using Fixed point arithmetic on ESP-32's Tensilica Processor. › Motor control drivers: BLDC/brushed/servo and I2C/SPI/UART drivers for LCDs for HMI applications. `Embedded C` `FreeRTOS` `ESP32` `ESP8266` `esp-idf` `Matlab` `git` `AWS`
SRA, VJTI Society of Robotics and Automation, Mumbai Nov2013-Mar2016	**CONTROL AND EMBEDDED LEAD | SECRETARY | ROBOTICS CHAPTER, VJTI** › Finalist at Robocon 2014 & 2016: taking our local chapter international and winning the Panasonic Award for Innovation. Robocon proposes novel semi-autonomous challenges for robotics in Asia. › Mentored India's debut FIRST Robotics FRC6026 to finish in the top 10 of Australian regionals. › Undertook workshops on embedded robotics for 300+ students around Mumbai (ARM, AVR, ESP32). › Product ideas: ↗ Hybrid HID ARM Cortex and wrist-watch multimeter at Texas Instruments Challenge. › Designed a winning grid solving robot at TechFest 2014, IIT-Bombay. `C/C++` `AtMega` `motor driver` `harness management` `NI Rio`

🎓 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. › 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. › MIT Media Labs DI: Open Sourced and prototyped a ↗ wrist band for taking 360°panoramas. › Courses on numerical techniques, applied math, digital signal processing, op-amps and filters, wireless communication, electromagnetic wave theory, VLSI design, control systems.

📖 PUBLICATIONS

Dec 2019	↗ Research in drone racing was featured at ↗ Business Insider ↗ Nature ↗ Wired ↗ Bloomberg ↗ 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), Gujarati (fluent), Dutch (A1/A2).