



Nilay SHETH
Embedded | Control Systems

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📍 Delft, Netherlands
✍ Embedded & Control at fuel cell tech
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PROFESSIONAL EXPERIENCE

zepp solutions
Feb2021-current

EMBEDDED SOFTWARE ENGINEER | CONTROL AND SOFTWARE TEAM

- > Embedded software for the Engine Control Units (ECU) of zepp solutions, a hydrogen fuel-cell company.
 - > Filtering sensor data, implementing Kalman observers, control for various automotive valves and pumps.
 - > Identifying and reporting failure modes within the fuel cell subsystem to vehicles in the heavy duty market.
- MISRA C Safety critical software fault detection ISO26262 J1939 CAN Jenkins-CI ARM Cortex R Infineon Aurix

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++ STM32 AtMega1280 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 featured at Business Insider Nature Wired Bloomberg BBC.
- Sept 2019 Thesis on state estimation and optimal control for racing drones.
- Sept 2017 Advances in Intelligent Systems and Computing (Springer, Germany) on LiFi Swarm Robots.
- Dec 2015 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 (A2).