



Nilay SHETH

Embedded | Control Systems

5 yrs of work exp. in the automotive, robotics & aerospace industry

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Netherlands, EU resident
 29 yrs, male

PROFESSIONAL EXPERIENCE

zepp solutions
 Delft,
 Netherlands
 Feb 2021 - current

EMBEDDED SOFTWARE ENGINEER

- 2½ years at zepp solutions, an H₂ fuel cell systems company prominent in the automotive industry.
- > Safety critical drivers for 30 onboard sensors, control & diagnostics for 15 pumps/motors/valves.
- > Adding state estimators, kalman observers, J1939-21 communication & J1939-73 diagnostics stack.
- > Realizing software architectures for safety critical ISO26262 ECUs (engine control units).
- > 4G telemetry pipeline for on field vehicles, data analysis tools, build tools for embedded firmware.
- > Expanding zepp's fuel cell test bench system, system integration testing, factory acceptance testing.
- > Onboarding zepp's firmware team to the V-model, build processes & software architectures.

MISRA C python Jenkins CI/CD J1939/CAN Infineon Aurix V-model static/dynamic/docs tools 4G telemetry

AlphaPilot
 MAVLab,
 Netherlands
 Jan2019 - Jan2021

ROBOTICS & CONTROL ENGINEER

- 2 years at AlphaPilot/AI Robotic Racing with MAVLab, TU Delft & Lockheed Martin, USA.
- > Won the AI racing world championship against 432 research teams, with a prize of \$1M (highlights).
- > Designed & deployed an optimal control algorithm to plan the trajectories in a time optimal manner.
- > Designed outlier rejection based filters - RANSAC localization for GPS denied navigation.
- > Sensor fusion for lower covariance state estimates and multi-PnP for better position estimates.
- > Implemented non-linear control for attitude heading and reference systems (AHRS).
- > Designed several support tools around the hardware in the loop (HiL) test setup.
- > Firmware for PercEvite, Sense-and-Avoid air traffic control (European Single-Skies initiative).

C++ computer-vision linux-preemptive RT ROS Matlab Python UAV HiL

Espressif Systems,
 Shanghai, China
 Jul2016 - Aug2017

FIRMWARE APPLICATIONS ENGINEER

- A year at Espressif, prominent in the IoT space with inexpensive feature packed WiFi chips.
- > Developed applications in esp-idf Amazon Web Services for embedded platforms.
- > Speech analysis & audio processing with FFT, LAPACK in C on ESP32's tensilica Processor.
- > Motor control drivers: BLDC/brushed/servo & I2C/SPI/UART drivers for LCDs for HMI applications.

C FreeRTOS ESP32 ESP8266 esp-idf Matlab git AWS

ACADEMICS AND CO-CURRICULARS

TU Delft,
 Netherlands
 Aug2017 - Sep2019

M.SC. MASTERS OF SCIENCE 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

B.TECH, BACHELOR OF TECHNOLOGY IN ELECTRONICS ENGINEERING

- > General secretary for the robotics chapter of VJTI & team captain for Robocon 2014.
- > Finalists ABU Robocon 2014 & 2016: winning the Panasonic Award for Innovation for India.
- > Mentored India's debut FIRST Robotics FRC6026 team to finish in the top 10 of Australian regionals.
- > Undertook workshops on embedded robotics for 300+ students around Mumbai (ARM, AVR, ESP32).
- > MIT Media Labs: wrist watch camera, Texas Instruments Challenge: wrist watch multimeter
- > 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.
- Sep 2019 Thesis on state estimation and optimal control for racing drones.
- Sep 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, ref: SRA, VJTI.
- Aug 2014 NHK Japan, Hindustan Times, Times of India: City College VJTI representing India internationally, ref: RoboCon 2014.

SKILLS

- Programming** Git, C/C++, SafeRTOS, FreeRTOS, PxROS, MATLAB, Python, OpenCV, ROS, multi-threading.
- Controls** PID, Kalman filters, state estimation, system identification, LAPACK, closed loop motor-control.
- Embedded** Infineon Aurix, STM32, ESP32, NI-Rio, MQTT, PCB design, oscilloscope.
- Languages** English (fluent), Hindi (fluent), Gujarati (fluent), Dutch (A2).