Nilay SHETH

Embedded | Control Systems

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

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Professional Experience

Fugro
Delft, Netherlands
Jun 2024 - current

Innovation Engineer

Developing an all electric underwater exploration robot with Fugro Innovation, a geosciences company.

- Developing & maintaining ROS based drivers & applications for thrusters & various onboard sensors.
- Board bring up for newer systems & conceptualizing architecture for distributed computing over DDS.
- Factory acceptance tests, commissioning & tuning robots before deployment for deep sea inspections.

C++17 | ROS2 | Docker | yocto | jira

zepp solutions
Delft, Netherlands
Feb 2021 - Nov 2023

Embedded software engineer

zepp solutions is an H_2 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 CAN bus & 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 | SafeRTOS/PxROS | Jenkins CI/CD | CAN | Infineon Aurix | V-model | static/dynamic/docs tools | confluence

AlphaPilot
Lockheed Martin Corp, USA
MAVLab, Netherlands
Jan2019 - Jan2021

Robotics & control engineer

AlphaPilot/AI Robotic Racing with TU Delft MAVLab, Lockheed Martin, MIT Aerospace.

- Won the AI racing world championship against 432 research teams, with a prize of $1M (highlights).
- Designed & deployed an optimal control algorithm to plan race trajectories in a time optimal manner.
- Implemented non-linear control for attitude heading and reference systems (AHRS).
- Designed outlier rejection based filters - RANSAC based visual localization for GPS denied navigation.
- Sensor fusion for lower covariance state estimates and multi-PnP for better position estimates.
- 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++ | OpenCV | linux-preemptive RT | ROS | Matlab | Python | UAV | HiL

Espressif Systems,
Shanghai, China
Jul2016 - Aug2017

Firmware applications Engineer

Espressif is prominent in the IoT space with their 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 Asia-Pacific Robocon 2014.
- Finalists ABU Robocon 2014 & 2016: winning the Panasonic Award for Innovation for the country.
- 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.

Languages | English (fluent), Dutch (A2), Hindi (fluent), Gujarati (fluent).