

# Karthik D K

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## Experience

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Senior Software Engineer	Bosch Global Software Technologies	August 2019 - Present
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### BuRner Assisted CatHeater (BRAC)

- BRAC is developed as a standalone PowerTrain slave ECU for external Catalyst Heating towards achieving EU7 norms.
- Implemented CAN communication between ECU and BRAC to achieve seamless operation of both ECUs.

### Dedicated Internal Combustion Engine (DICE)

- Contributed to a project focused on emission reduction to achieve EU7 norms using hybrid engines.
- Implemented complete functional features for integrating NOx/NH3 sensors into gasoline engines.

### Exhaust Management

- Developed a comprehensive component for reading temperature sensors via CAN and implementing sensor diagnostics for EU7 compliance.
- Implemented statistical features to analyze temperature spread across catalysts for improved emission control.

### MLLib DecisionTree Inference

- Developed an inference algorithm for DecisionTree in C for PowerTrain ECU.
- Utilized Flat Buffers for defining and parameterizing the model via calibrations.

## Skills

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**Programming Languages:** C, Rust, Python

**Tools and Frameworks:** Git, PyTorch/fastai, ASCET, GNU Make, Linux

**Languages:** Kannada, English, Telugu

## Certifications

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Machine Learning	Certificate
Coursera	2020

## Education

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University Vishweshwaraya College of Engineering	75.2%
B.E in Electronics and Communication	2019
Devaraja URS PU College	94.5%
PUC	2015
MABL High School	95.2%
SSLC	2013

## Achievements

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### Awards and Honors

• One Time Award	Department Head
• Bronze Award	Group Manager
• Shout out	Manager
• Extra miler	Manager
• Hackathon Winner	AI/ML
• Participated twice in Chess championship	State Level

## Projects

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### Open Source projects

#### robot-hat-rs

- Developed the unofficial Rust implementation of the robot-hat Python Library.
- Published library on [crates.io](https://crates.io) garnering approximately **1k** downloads from the community.

#### ixv

- Developed a CLI application in Rust for verifying intel hex file(s).
- Published library on [crates.io](https://crates.io) garnering approximately **1k** downloads from the community.

#### picars

- Created an autonomous vehicle system using Raspberry Pi and PiCar-X kit, leveraging Rust and Python.
- Developed Rust bindings and interfaced with Python to optimize execution speed.

#### rprs

- Developed a CLI application in Rust for file replacement operations.

#### Blog

- Blogging about interesting bits regarding Software Engineering and Deep Learning.

#### Open-Source Contributions

- Actively contributing to GitHub projects, including notable contributions to fastai and FluxML Deep Learning libraries.

## Graduation project

### Closed loop control of Anesthesia Administration

- Designed an automated closed-loop control system for General Anesthesia using a PID controller.
- Developed a system to regulate the depth of hypnosis using propofol administration and Bi-Spectral Index (BIS) as a controlled variable.
- Implemented the project using MATLAB/Simulink.