# Karthik D K

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## Experience

*Senior Software Engineer* — *Bosch Global Software Technologies* — *August 2019 - Present*

**MLLib DecisionTree Inference**

- Inference Algorithm for DecisionTree for creation of interface to an embedded device (ECU)
- Flat Buffers are used for defining and parameterizing complete models via Calibrations.

**BuRner Assisted CatHeater (BRAC)**

- BRAC is developed as a standalone PowerTrain ECU Software and as a slave software in combination with Conventional master ICE engine for reduction in emissions towards achieving EU7 norms.
- CAN Communication between ECU <=> BRAC were implemented to achieve seamless working of both ECUs.

**Dedicated Internal Combustion Engine (DICE)**

- This project is dedicated towards investigations regarding emission reduction in achieving EU7 norms using Hybrid engines.
- Complete Functional feature implementation for enabling NOx\NH3 sensor integration into Gasoline engines

**Exhaust Management for Porsche**

- Implemented a complete component for reading temperature sensors via CAN, diagnosis of those sensors for EU7 norms.
- Implemented statistical feature to test for temperature spread across Catalyst w.r.t. better emission control.

**Adaptive Learning of Torque Limitation**

- Robust Learning model of torque limits implemented as a weight-based rank model which computes ranks for each torque Limitation, with following process.
- System Impact / Benefits, Advantages such as Warranty claims, Sensor/Component diagnosis and Improving Engine life.

## Skills

**Programming Languages:** C, Rust, Python and Julia
**Tools and Frameworks:** Git, PyTorch/fastai, ASCET, GNU Make, Linux
**Languages:** Kannada, English, Telugu

## Certifications

**Machine Learning** — Certificate
*Coursera* — 2020

## Education

**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

*Awards and Honors*

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

## Projects

### Open Source projects

**robot-hat-rs**

- The unofficial Rust implementation of robot-hat Python Library.
- Library can be found on crates.io and has around **100 downloads** from the commmunity.

**picars**

- Autonomous Vehicle using Raspberry Pi and PiCar-X kit created using Rust and Python.
- *Key Learnings:* Developed Rust bindings and interfaced with them through Python to optimize execution speed.

**Blog**

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

**rprs**

- A CLI application for replacing file(s) written in Rust.

**c-pro**

- Implementing solutions for the exercises in the K&R C Programming book.

**Open-Source Contributions**

- Started contributing on GitHub recently, notable mentions being contributed to fastai and FluxML Deep learning libraries

### Graduation project

**Closed loop control of Anesthesia Administration**

- Project was designed to automate closed loop control of General Anesthesia using PID controller
- It is used for regulating the depth of Hypnosis using propofol administration and Bi-Spectral Index (BIS) value as a controlled variable.
- Developed/Programmed using MATLAB/Simulink