Bharat Somashekar

M.Sc. student at Uni Stuttgart

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Area of Expertise

- C++, Python, Java Applications
- Embedded Software Development
- Artificial Intelligence

Skills

Software Design 5 yrs.

Embedded Linux/ Build System 4+ yrs.

C, C++, Linux 4 yrs.

Python, Java 2 yrs.

GUI - Qt Creator 2 yrs.

GIT, CI/CD 4 yrs.

Agile Methodology 4 yrs.

Vehicle Infotainment 4 yrs.

Work experience

IoT Software Development| HiWi — 02/2021 - today

Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO | Stuttgart, Germany

- Design and development of an Internet of things (IoT) based application that can control and update the meeting room displays connected to raspberry pi display clients.
- Python3 based server and client Linux application which uses MQTT as messaging queue. A PHP based web application acts as a user interface for the entire application

Java Application Development | Working Student — 02/2019 - 07/2020

Robert Bosch GmbH | Stuttgart, Germany

- Java application design and development for automotive network protocols simulation and the development of the corresponding graphical user interface.
- The GUI was developed using Eclipse Windows Builder in Java adhering to MVC design pattern

Software Developer 2 — 08/2017 - 08/2018

Infinera India Private Limited | Bangalore, India

- Development and maintenance of C++ based FCAPS applications (Fault, Configuration, Accounting, Performance, Security) for optical amplifiers and multiplexers.
- Analysis and maintenance of the entire Platform Controller software that can control the optical equipment in the chassis.
- Fault tolerant scratch pad application development to overcome the shortcomings of FPGA memory bitflips.
- Tools: C, C++, Linux, QNX, PPC, simulated hardware, Perforce, Designing Tools, vim based IDE

Senior Software Engineer — 07/2014 - 08/2017

Robert Bosch Engineering and Business Solutions Private Limited | Bangalore, India

- Development of car multimedia and connectivity software for trucks.
- C++ based Gateway application framework development to connect middleware applications to the user application.
- C++ based Smart Card Reader and Tachograph reader modules development.
- Maintenance of CAN and Diagnosis gateway modules.
- Support in the development of Bluetooth, WiFi and GSM Multiplexer middleware applications
- Google Test and Google Mock based Unit Testing.
- Software development in accordance with MISRA coding standard.
- QT creator based GUI development to ease the rapid testing of the connectivity application
- Tools: C, C++, shell scripting, Linux Ipc, Dbus, Gdb, iMX6 platform, Git, Gerrit, static tool analysers, QT creator, CANoe, Linux, Windows environment, UML, Enterprise Architecture

Internet of Things 3 yrs.

Machine/Deep learning 2 yrs.

Language

English C1

German B1

Education

10/2018 - today

M.Sc in INFOTECH

University of Stuttgart | Stuttgart. Germany
Deep learning ▪ Machine Learning ▪ Embedded Systems ▪ IoT
Master's thesis: „GANs for LiDAR point cloud denoising and synthetic-to-real translation".

07/2010 - 06/2014

B.E in Electronics and Communication
Visvesvaraya Technological University | India
Embedded Systems ▪ IoT ▪ Automotive ▪ Real time Systems
Bachelor's thesis: „Multibot communication".

Hackathons

- **Unity Hackathon 2019:** 3rd prize.
- **IVS Hackathon 2019:** Best idea award.
- **Bosch Hackathon 2016 India:** Obtained Sponsorship
- **ARM Symposium 2014 India:** 2nd runner up prize

Academic Projects

Master Thesis Student **01/2021 - today**
Institut für Signalverarbeitung und Systemtheorie (ISS)
University of Stuttgart

GANs for LiDAR point cloud denoising and synthetic-to-real translation:

- Development of Deep learning networks to denoise the Lidar point clouds obtained from severe weather driving conditions, as well as the domain adaptation from synthetic Lidar 3D point cloud to real Lidar 3D point Cloud.
- Implementation of CycleGAN, CNNs based denoising, Variational Autoencoder based translation and a novel approach called the MaskGAN which uses mask priors to detect outlier and reconstruct the LiDAR data
- Tools: Python, PyTorch, GANs, CNNs, NumPy, mayavi

Conversational AI **10/2020 - 03/2021**
Institute for Natural Language Processing
University of Stuttgart

Engagement Tracking using Deep Neural Networks:

- Development of a Deep Neural Network application that can predict the dynamic engagement level of a person in a conversation using head pose, gaze, and facial action units of the person.
- OpenFace library is used to extract the facial features of the person. Preprocessing and cleansing of the extracted data.
- Tools: Python, TensorFlow, Openface, BLSTM with Attention

Interaktive Systeme: Machine Learning for HCI **10/2019 - 02/2020**
Department of HCI and Cognitive Systems
University of Stuttgart

Spatio-temporal visual saliency prediction on GUI:

- A machine learning and a deep learning based approach to predict where the user would focus his attention on the GUI using his mouse, keyboard activities without the need of an eye tracker.
- Tools: Python, Jupyter Notebook, Logistic regression, LSTM based prediction

Smart cities and IoT **04/2020 - 09/2020**
Institute of Architecture of Application Systems
University of Stuttgart

Smart study room:

- Artificial Intelligence Planning based IoT project that can track the people count in the room.
- MQTT messaging protocol used for the wireless data transfer
- Tools: Python3, MQTT, Tkinter, AI planner