CURRICULUM VITAE

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OBJECTIVE

A Challenging position, which keeps me abreast with new technology, allows me to show my capability to full strength, so that the growth of the company and me should be eminent.

WORK EXPERIENCE

Master Thesis **01.04.2015 – 30.09.2015**
KUKA Roboter GmbH, **R&D Technology Development, Augsburg.**
Research Topic: A framework for non-expert robot programming facilitated by a self-localizing smart device.
Objective: A smart device (Project Tango smartphone) equipped with high-end sensing capabilities facilitates the programming of industrial robots in the field of logistic tasks such as pick-and-place and packaging.

- Created requirement specification, compared and used computer vision state-of-the-art algorithms.
- Implemented algorithms - Hough Circle and Cylinder Model Segmentation using OpenCV and PCL libraries.
- Developed an android app to publish the on touch 2D pixel coordinate.
- Implemented ROS nodes for estimating the pose of the fixed marker.
- Developed algorithms and implemented in C++ on ROS platform to locate objects and box.
- Designed and developed software API in Java on sunrise.workbench to subscribe commands, define motions, control Robotiq gripper parameters, teach LBR iiwa robot for the desired task.
- Tested the design in every step.

Internship **01.09.2014 – 28.02.2015**
KUKA Roboter GmbH, **R&D Technology Development, Augsburg.**
Research Project: Developing pick-and-place robotic applications using Project Tango smartphone on ROS (Robot Operating System) platform.

- Trained for application development utilizing KUKA Sunrise.Workbench.
- Gained an understanding of motion planning, safety standards, controllers, and control software libraries through several LBR iiwa robot tutorials.
- Developed an android app from scratch to parse superframe for depth and RGB images and publish live images into ROS network over (Wi-Fi).
- Developed a software node (C++) on ROS platform in Linux-PC to subscribe & process images.
- Realized 2D to 3D transformation algorithm.
- Developed software APIs in Java on sunrise.workbench to teach LBR iiwa robot for pick-and-place.
- Procured good experience in programming KUKA LBR iiwa robot, android and exposure to open source software libraries – ROS, OpenCV and PCL.

Application Engineer **05.07.2010 –19.08.2013**
Microchip Technology Private Ltd (INDIA), **Bangalore.**

- Responsible for providing embedded solutions to the customers and promoting the use of microchip's PIC microcontrollers and other products.
- Designed embedded software and hardware.
- Developed peripheral libraries for PIC microcontrollers using **C**.
- Upheld the coding standards in all the developed software designs and codes.
- Edited and published multiple technical documents such as Datasheets, FRMs, Migration Guide, and programming specification for 8, 16, and 32-bit PIC microcontrollers.
- Reviewed and responded to internal and external customer inquiries in a timely manner.

Test Automation, Microcontroller functional validation and characterization

- Defined the validation/characterization plans and unit level test cases.
- Developed and maintained re-usable firmware for post-silicon validation by reducing time-to-market and ensuring quality.
- Involved in the development of common "AutoVal" software platform for validation.
- Implemented LabVIEW VIs to automate the characterization of DUT.
- Created test and bug reports.
- Documented the process.

Reference design, Magnetic Stripe Card Reader using PIC24FJ128GA310 16-bit microcontroller.

- The high-speed, high-resolution on-chip ADC is used to read information directly from the magnetic read head. Data on the stripe have been viewed using a PC's terminal program via an RS-232 connection.
- Team of 3 members.

Tasks

- Created requirement specification, compared and sourced suitable PIC microcontroller.
- Interacted with the customer to realize the design on time.
- Designed an analog circuit and stabilized it by improving signal to noise ratio to meet the specifications.
- Implemented algorithm in embedded **C** to decode analog signals from the magnetic read head.
- Built an android app to send continuous signal through an audio jack to power up the PIC.
- Tested the design against ISO/IEC 7813 standards.
- Wrote an app note to give vivid ideas to customers to use the products.

PICAutoDroid, Mobile Robot using PIC18F452 8-bit microcontroller

- Analyzed requirements, designed model, and control algorithm.
- Developed software in embedded C.
- A Bluetooth module RN-42 is connected to the PIC for wireless communication.
- Developed an android app to establish Bluetooth communication link between PIC and android device.
- Commanded robot by sending voice as well as position commands to accomplish the task.

EDUCATION

Hochschule Darmstadt, Germany **September 2013 – present**	Master of Science in Electrical Engineering System Design **(C++ & UML),** Technical Project Management, Advanced Feedback Control (**Matlab & Simulink**), Design and Test of Microelectronic Systems **(FPGA & ARM)**, Complex Digital Architectures, Autonomous Systems **(mobile robots & task planning)**, Advanced Information Technology **(Java & Android)**, Advanced Automation **(Matlab & PLC),** and Advanced Robotics.
The National Institute Of Engineering, Mysore **September 2006 – June 2010**	Bachelor of Engineering in Electronics and Communications Engineering (First Class with Distinction). Basic and advanced Mathematics, Object Oriented Programming using C++, Data structure using C++, Image processing, Electronic Circuits and Design, Signals & System, Digital Signal Processing, Analog and Digital Communication, Microcontrollers, Microprocessors, Wireless Communication, Embedded System Design.

Academic Projects –

Sensor suit **01.03.2014 – 30.06.2014**

Objective: Inertial sensor suit with full-body motion verification module.

- Led the team of 6 members.
- Programmed ARM based 32-bit STM32F103RET7 microcontroller to receive and process data from IMU sensor.
- Developed C# code with the Microsoft .NET Micro Framework.
- Developed LabVIEW VIs to acquire measurement data via serial interface.
- Validated, demonstrated, and delivered the working prototype to the customer (Supervisor).

Wireless multichannel data acquisition with alerting and automatic control system. **01.02.2010 – 30.06.2010**

Objective: Industrial application for keeping the machines safe from fire and labors from hazardous gases.

- Team of 4 members.
- Sourced commercial off-the-shelf (COTS) components for the project.
- Designed and installed two systems, one at working unit and other one at control unit.
- System at working unit composed of atmel89s52 microcontroller, zigbee transceiver, relays, temperature, and gas sensor. Latter, includes atmel89s52 microcontroller, zigbee transceiver, and LCD display.
- Designed PCB and control algorithm.
- Developed embedded software in C to read sensor data through I2C and transmit across UART to zigbee then to control unit. Control unit receives data through zigbee module and displays the status on LCD.

Hobby projects –

Monocular Visual Odometry on android **10.10.2015 – present**

Objective: Implementation of visual odometry algorithm using Java and OpenCV native C++ libraries on android platform utilizing the camera in the smartphone.

IoT Home Automation **01.04.2014 – 30.07.2014**

Objective: Save the money on the energy bills.

- Developed an android application to schedule alarms and interface with the Raspberry Pi.
- Interfaced dimmer module to Raspberry Pi to dim the bulb (powered by AC).
- Connected 4 relays to the board to switch on/off the home appliances.
- Developed embedded software in C++ on embedded linux platform to receive the commands from android smartphone over wireless communication link (Wi-Fi) and actuate the interfaces.

SKILLS

General: Good understanding of concepts in microelectronics, embedded systems, algorithms, mathematics, object oriented programming, robotics. Analytical problem solving, failure analysis in both software and hardware. Usage of many software according to its need.
Programming Languages: Assembly**,** C, C++, VHDL, Python, Perl, C#, Java, PLC (Ladder and FBD).
Microcontrollers & Processors: PIC18, PIC24, dsPIC, PIC32, 8051, AT89S52, STM32F103RET7, ARM Cortex-M3, MIPS, and 8085.
Microcontroller fundamentals: ADC, DAC, Timers, PWM, DMA, WDT, RTCC, IC, OC, and PTG.
Communication Buses: SPI, I2C, RS-232, CAN, and LIN.
Operating Systems: Ubuntu, Embedded Linux, Windows, Android, and FreeRTOS.
IDEs: Eclipse, Visual Studio, Android Studio, MPLAB 8, and MPLAB X.
Software tools: LabVIEW, Matlab, Simulink (computer vision toolbox, Raspberry Pi hardware), Borland Together (UML), Latex, Microsoft Office, CadSoft EAGLE, Unity 3D, Blender.
Software development models: V-model and Agile model.
Open-source software libraries: ROS, OpenCV, PCL, and ARToolKit.
Sensors: Kinect, IMU, Temperature, Gas, Fire, and Ultrasonic sensor.
Embedded Development Boards: Explorer 16, Raspberry Pi, BeagleBone Black, and STM32 Nucleo.
Wireless communication modules : Zigbee (Maxstream XBee RF Module), and Bluetooth (RN-42 module).
Lab Equipments : Agilent &Tektronix Oscilloscope, Function generator, Digital multi-meters, DC Power supply, Thermonics , Soldering, and CAN BUS Analyzer (Microchip).
Build Automation Tools: make, gradle, and cmake.
Industrial Robots : KUKA LBR iiwa 7 R800, Adept Cobra s600 Scara Robot.
Languages: English & Hindi(native proficiency), German (working proficiency), and Kannada (mother tongue)**.**
Other Skills: Project Management, Presentation, IoT, HIL testing, Test Automation, Documentation, XML, FPGA, Xilinx, MOST, Compilers - GCC, MPLAB C, HI-TECH, MPLAB XC, software test coverage (CTC++), Debugging (gdb) tools, version control system (Tortoise svn), GitHub, Bug-Tracking-Tools(Jira), PCB Design, Requirement analysis.

ACHIEVEMENTS

- Several recognition certificates for the significant achievements at Microchip Technology.
- Satisfied many internal & external customers by meeting their needs.
- Won a gold medal in Kho-Kho tournament.

PERSONAL TRAITS

- Willing to learn new technologies.
- Self-motivated.
- Able to meet targets.
- Ability to work under pressure.
- Good resource management and a self-starter.
- Able to understand work responsibility and follow accordingly.

HOBBIES

Yoga, Cooking, Movies, Music, Badminton, Books, Cycling, Chess.

(Mallikarjun Tirlapur)