Hemanth **Guruva Reddy**

EMBEDDED SOFTWARE DEVELOPER · MECHATRONICS

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Summary

Embedded Software developer at Nokia hacking Linux for its eNB. 5+ years experience in opensource development and writing code close to the hardware, be it for telecommunication or motion-control. Super nerd who loves Cars, Robots, Emacs, Vim and Linux enjoys to customize the development environment. Interested in solving challenging problems, implementing efficient solutions on systems with low resources for applications in different industries. Like to learn new technologies and tools if the need arises.

Skills

CPU Architectures	x86, Coldfire(v4e), ARMv7 and ARMv6, AVR
System Bus	PCIe, I2C, SPI
Programming	C, C++, Perl, Shell, Python, JAVA, LaTeX
Build Tools	Autoconf, GNU make, Cmake, Buildroot, Bitbake
Operating Systems	Linux kernel, FreeRTOS
Simulation Tools	Matlab/Simulink, LabVIEW
Spoken Languages	English - Fluent, German - Intermediate

Work Experience

May. 2013 - PRESENT
Ulm, Deutschland

Nokia Mobile Networks
EMBEDDED SOFTWARE DEVELOPER

- Make bug fixes in kernel and userspace for Nokia's eNB
- well versed with FPGA architectures required for re-configurable computing.
- Took up responsibility to support and maintain software stack to access and use FPGA based devices inside Platform Software.
  - write kernel device drivers for controllers implemented on FPGA.
  - write kernel drivers to initialize/program the FPGA themselves during system run-time.
  - implement overlay device-trees for set of devices implemented on FPGA.
  - During introduction of new FPGA, Co-ordinate with Board designers and FPGA designers to help make architecture decisions on Register layouts, Interrupts and Bus to be used to connect the FPGA to SoC's.
  - manage delivery and automate packaging of FPGA images (received from HW designers) inside LFS release cycles.
- Implement Feature Requests from Product owner in the field of FPGA management within LFS (Feature management)
  - Breakdown Feature requests into intended implementation.
  - Design is converted into work packages
  - Make effort estimations, derive dependencies between each work packages based on past experiences in implementation. This data is passed on to product owner for tracking until the release.
  - Start implementing the packages one by one. and update the status.
- Help in the transitioning of LFS startup of eNB from sysv init scripts to systemd based unit files.
- Pick up functional programming like erlang for concurrent and hot-swappable code in userspace.

Jan. 2012 - April. 2013
Ulm, Deutschland

Sysgo AG
EMBEDDED SOFTWARE DEVELOPER

- Joined as a contractor to work as Linux kernel developer for Nokia.
- Gather requirements from DOCOMO and implement them in Linux kernel used within eNB's supplied by Nokia.

| Sept. 2006 - Oct. 2009 | **Novell Software Development. Ltd.** |
| *Bangalore, India* | Senior Software Developer |

- Joined the team responsible for the maintenance & development of eDirectory LDAP Server.
- contribute fixes towards libSAL (platform abstraction library used in eDirectory), work on libSAL gave me a chance to teach myself OS fundamentals, understand commonalities and differences between
     OS's : HP-UX, AIX, SOLARIS 9, Linux, Netware.
     CPU architectures: x86, SPARC, PowerPC.
- Design and deploy an inhouse test harness.
     - Split the harness into multiple classes, each class representing a component in test-environment. Write clean interface APIs between each component. Test-Logic were themselves defined as objects based on test-case class thereby preventing the lab-environment details leaking into the test-logic.
     - Usage of Event loops based design pattern implement server component of harness which watched for the build events, pulled a build as soon it was ready, install the builds on test machines, execute the test-objects and push results into a database.
     - This was the first take on deploying continuous integration inside the department.
- Begin development of a LDAP Proxy server as a member of a small team.
     - Obtain the requirements from the Product owner & architect to design components for the server using bottom up and Test Driven Development approach.
     - Components: load-balancer, re-create LDAP trees on the fly, connection statistics component.
     - Lead the automated test development for integration tests right from the start of the project.
     - breakdown the entire task of quality into tiny tasks with effort estimations, dependencies and identify the sprints the tasks would go into.
     - constantly add features to test framework to automatically publish and generate analytics from the test-results.
- Contribute to kerneljanitors with tiny fixes to Linux kernel.

Projects and Thesis

| May. 2010 - Sept. 2010 | **Hochschule Ravensburg-Weingarten** |
| *Weingarten, Deutschland* | Master Thesis: Implementation of Simulation Models of Mobile Robots as Plants inside LABVIEW |

- Study of few mobile robots available in our lab and derive its mathematical properties, implement them as LABVIEW models. Dr.-Ing Bern Altmann was intending to use LabVIEW to simulate and perform theoretical studies on different control strategies.

| Jan. 2010 - Jul. 2010 | **Hochschule Ravensburg-Weingarten** |
| *Weingarten, Deutschland* | Scientific Project: Design of a Hardware Test Bench to simulate Engine input into a Gearbox |

- Design & implementation of simulation testbench using a single-board computer controlling a DC drive.
- Objective was to simulate the input of an engine to a gearbox. Later the testbench was purposed as a Hardware-in loop simulation environment to develop "Gearshift by wire" implementation for Formula Student.

| Oct. 2009 - Dec. 2009 | **Hochschule Ravensburg-Weingarten** |
| *Weingarten, Deutschland* | Research Project: Design a Control algorithm for a robotic mobile platform |

- Derive a simple model & design a digital controller for the mobile robot designed to be used as a transporter on a factory floor.

Dec. 2005 - Sept. 2006	**BTL Institue of Technology**
	Research Project: Personalized Passenger Alter System on Destination arrival in Long distance bus
Bangalore, India	Multi-Stop Night Journeys

- Requirement: Design a system to wake up and notify a passenger individually on arrival of his/her destination instead of calling out destination names loudly inside the bus as done in rural India.
- Solution was split into into two modules:
     - module1: an eeprom stores two tables, one table of destinations in the route along with its GPS co-ordinates, second table that maps seats to its destinations (based on booking data), thereby mapping passengers to their respective destinations.
     - at the start of the journey driver plugs module1 into module2.
     - module2: continuously acquire GPS data and actuate wake-up elements on seats (based on data obtained from module 1) to indicate arrival of destination.
- Design and implement a small proof of concept both modules based on PIC uC and tiny DC drive vibrators fixed into armrests as actuators to keep costs low.
- Document the work

Education

| 2009 - 2011 | **Hochschule Ravensburg-Weingarten** |
| *Weingarten (Würt), Deutschland* | MSc in Mechatronics |

- Theory of Mechatronic system development. (V-Model development, Simulation based development, Test Driven Development).
- Design of Mathematical models for simulations.
- Motion Control algorithms for mobile-robots and six-axis robots.
- Programming & Applications of Sensors and Actuators.
- application of OpenCV as sensors.

| 2002 - 2006 | **Visveswaraya Technological University** |
| *Bangalore, India* | B.E IN ELECTRONICS AND COMMUNICATION |

- Basics of Digital and Analog circuit design.
- Learn Computer architecture, focusing on micro-controller & DSP programming.
- Analog and Digital Filter Design.
- Got first taste for GNU/Linux and open-source development. Was active participant in spreading GNU/Linux evangelism and GNU/Linux awareness within my department by holding install-fests and gcc usage tutorials.
- Thesis: Designed PIC micro-controller based system basedDesign a system to wake up and notify a passenger individually on arrival of his/her destination for a transport firm.

Extracurricular Activity

| 2004 - 2007 | **Early Member of BLUG.** |
| *Bangalore, India* | BLUG - BANGALORE LINUX USERS GROUP (DEVELOPERS' NETWORK FOR LINUX) |

- Early open-source evangelist by Hosting Linux installfest parties and constant support for new members choosing to use GNU/Linux as a primary OS to spread GNU/Linux awareness in my campus.
- Was an active volunteer in first two FOSS.IN events.
- Network and gather private groups of Linux users in Bangalore and introduce them towards the common platform to share their then experiences on programming on Linux.
- Now a defunkt group, as it had served its primary purpose and Linux was mainstream by end of its life.

| 2004 - 2007 | **Contributer** |
| *Ulm, Deutschland* | ULMER GARAGE - CONTRIBUTING TIME TOWARDS BUILDING A MAKERSPACE WITHIN NOKIA |

- contribute some spare time towards building a Maker space within Nokia's Ulm site, hosting events to promote maker culture.