## **C.Narayana Setty**

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**OBJECTIVE**

Pursuing a challenging and rewarding career in the field of Multimedia signal processing and product development, where I can use my technical skills and expertise and excel through constant learning.

**WORK HISTORY**

* 11+ years of experience
* Working as Senior Engineer for Samsung Electronics, South Korea in Imaging SW R&D Team since December 2013.
* Worked as Software Engineer for Tandberg (Tandberg is now part of Cisco Systems), Bangalore from August 2009 to November 2013.
* Worked as Member of Technical Staff for Stream Processors India Ltd, Bangalore from August 2007 to July 2009.
* Worked as Senior Software Engineer in Video Encoder Reference team for Emuzed India Pvt. Ltd (Currently Aricent), Bangalore from August 2004 to July 2007.

**EDUCATIONAL QUALIFICATION**

M.E. (Master of Engineering)in Signal Processing from *Indian Institute of Science* (July 2004), Bangalore, India. **GATE RANK – ALL INDIA RANK *4* *(99.97 Percentile, 2002)***

**WORK SUMMARY**

* Worked on Still image capture framework for Samsung's NX1 and NX500 mirror less cameras.
* Hands on experience in Camera system software development from framework level to driver level, and implementation of 3A algorithms, OMAP4 ISP, OpenMax IL camera component, customization of Linux device drivers; experience with multi threaded programming using TI's BIOS(RTOS), software development in multi-core environment, C64x Optimization,
* Exposure to a full Product development life cycle, starting from concept to the final shippable product
* Expertise in the Design and Implementation of H.264 Baseline profile video encoder algorithms for a massively parallel, SIMD based DSP, Stream Processor, developed reference C++ code for H.264 High Profile CABAC decoding hardware engine
* Experience in the full life cycle software development (Design & Implementation) of H.264 High Profile video encoder and efficient algorithms implementation in C.

**RELEVANT SKILLS**

* Programming Languages – C, C++, Matlab, C64x Assembly
* Version Control Systems **–** git, svn, Perforce
* Debugging with Trace32.
* Currently exploring OpenCV

**PROJECTS SUMMARY**

1. **NX1, NX500 and 360 degree camera**(at Samsung Electronics)(December 2013 - Present)

* Implemented object oriented capture framework for Still image capture(from processing of Bayer image to JPEG encoding)
* Lead the development of Still image capture framework for a 360 degree camera(2 sensors)
* Implementation of pipelines for different modes of Still capture like Multi exposure(Overlapped image capture), HDR, Panorama, High ISO image capture, Burst capture
* Implemented new features like Beauty Shot by coordinating with 3rd party IP vendors.
* Improved the performance of continuous capture shooting by 5% by optimizing the data path.

1. **Videoconferencing system on OMAP4 platform(Cisco's SX10)** (at Tandberg/Cisco) (June 2010 – Nov 2013)

* Owner of Camera module, SW architect and Technical mentor
* Customisation, fine tuning and Integration of proprietary 3A (auto exposure, auto white balance and auto focus) algorithms into the TI's OpenMax camera component.
* Involved in fine tuning the parameters of the ISP HW blocks.
* Implemented a low latency Capture data path.
* Design and Implementation of Digital zoom feature.
* Indepth understanding of the camera framework from OMX layer to the driver layer.
* Developed Aptina CMOS image sensor specific ducati(Dual core Cortex M3) driver code
* Focus, Zoom and Iris motor driving scheme Implementation
* Feasibility study & analysis of stepper motor driving scheme on OMAP4 platform
* Design & Implementation of efficient motor driving scheme by interacting with HW team.
* Integration and fine tuning of auto focus algorithm with the motor drivers
* Feasibility study and analysis of getting HDMI/VGA input into the system by using a HDMI/VGA to parallel data out converter chip and a parallel to CSI2 converter bridge chip.
* Interacting with the chip vendors to understand the functionality and configuration of the chips to meet the requirements of the system
* Development of software for qualification of lenses and interacting with the Optics engineers and Lens manufacturer for setting up of appropriate constraints on lens quality
* Implementation of camera software to fine tune the lens and sensor board assembly process
* Implementation of Pan and Tilt motor driving schemes.

1. **Videoconferencing system on DM365 platform** (at Tandberg) (August 2009 – May 2010)

* Design and Implementation of Face prioritized Auto Brightness algorithm. Face/non face region classification within the Face area as output by the engine. Adapted an existing auto exposure algorithm to use the output of the Face detection engine in improving the performance of the algorithm under High back light scenes and over exposed face scenes.
* C code optimization of the 3A algorithms
* Integration of TNF(Temporal noise filter) library into the camera Data Flow path.
* Optimization of capture to display latency (from 3 frames to less than a frame time) by modifying the V4L2 drivers
* Developed a scheme for successful recovery of the camera when subject to ESD pulses.

1. **Motion Estimation on Stream Processor** (at Stream Processors)(May 2008 – July 2009)

* Design & implementation of full search based ME algorithm suitable for StreamProcessor architecture.
* Adaptation of the algorithm for different performance vs quality tradeoff levels.
* Mapping and optimization of Deblocking, Transform & Quantisation modules of H.264 for StreamProcessor.

1. **Reference code for Hardware Bitstream Decoding Engine (CABAC & CAVLC H.264 High Profile)**(at Stream Processors)(August 2007 – April 2008)

* Involved in defining the functionality of some of the hardware CABAC primitives and implementation of CABAC decoding code using these primitives in C++.
* Development of bitstream decoding library using the hardware engine and integration of the same with the H.264 High Profile decoder running on Stream Processor.

1. **Reference C code of H.264 High Profile Encoder** (at Emuzed)(Aug 2004 – July 2007)

* Worked on the High Level and Low level design of the H.264 High Profile encoder and preparing the design documents and implementation of the encoder in C.
* Design and implementation of Spatio Temporal neighbhors based motion estimation algorithms for different performance vs tradeoff levels. Adapting these algorithms for field pictures and B pictures,
* Implementation of algorithm for fast macroblock adaptive frame/ field decision and other mode decisions, efficient implementation of Rate Distortion optimized mode decisions,
* Developed a novel algorithm to efficiently determine the macroblocks not to be coded by estimating the number of bits required to code a block.

1. **Audio Coding using a Non Stationary Sinusoidal Model (M.E. Project)**

**Guide** Prof T.V.Sreenivas

A perceptually transparent low bit rate audio coder was developed using a non stationary sinusoidal model for speech and audio signals. The audio signal is parameterized using the non stationary sinusoidal model and the efficient quantization of those model parameters is explored. Perceptual sensitivity of the model parameters to the quantization noise is determined (by exhaustive experimentation) to design appropriate quantizers for each of the model parameters.

**ACADEMIC DETAILS**

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| **Course/Degree** | **Institution** | **Year of Passing** | **% / CGPA** |
| M.E. (Signal Processing) | Indian Institute of Science, Bangalore | 2004 | 6.4/8.0 |
| B. Tech (Electrical & Electronics Engineering) | G.Pulla Reddy Engineering College, S.K. University, A.P. | 2002 | 81.3% |
| Intermediate (MPC) | Govt. Junior college, kurnool, A.P. | 1998 | 97.78% |
| X Class | Everest English School, Kurnool, A.P. | 1996 | 86% |