VISHAL SAHU

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EDUCATION

Stony Brook University(SUNY), United States **Aug 2015-Dec 2016(expected)**
Masters in Computer Science(GPA:3.67)

- **Relevant coursework**: Operating Systems, Analysis of Algorithms, Computational Biology, Artificial Intelligence.

National Institute of Technology, Tiruchirappalli, India **Jul 2007-May 2011**
B.Tech, Electronics and Communication Engineering (GPA:8.76/10.0)

- Degree Honors: First Class with Distinction
- Project: Optimization of Speech Recognition System using Linear assembly

TEHCNICAL SKILLS

Languages: **C, C++**(proficiency), Python(basic)
Operating System: Linux kernel development(1 year), Windows
Tools & platforms: MATLAB, LaTeX, Git, OpenGL

PROJECTS

Anti-malware stackable file system(amfs), Stony Brook University **Fall 2015**

- Implemented stackable file system *amfs* module for Linux kernel. Sandwiched between VFS and native filesystems such as EXT3/4, it detects and prevents reading or writing of bad patterns.
- Designed version keeping mechanism to re-validate the files marked as BAD or GOOD efficiently, if the database is updated. Maintaining database in such manner helps in easy frequent updates without rescanning.
- Developed user level interface to add/remove specific pattern to the existing database of forbidden mal-patterns.

Asynchronous utility module for linux kernel, Stony Brook University **Fall 2015**

- Designed asynchronous utility module for linux kernel performing various operations e.g., encryption, compression, checksum etc.
- Implemented producer-consumer job queue supporting priority and fair scheduling. In multi-threaded execution scenario, the asynchrony is handled using various kernel locks. It's very useful for file systems requiring these utilities for specific files concurrently.

Encryption/ Decryption module for Linux kernel, Stony Brook University **Fall 2015**

- Developed Linux kernel (vanilla 4.0.y) module that adds new system call to perform encryption/ decryption of input file.
- Performs all possible error & inconsistency checks on input files and lets user choose type of cipher. It's very useful for file systems requiring secure access to specific files natively.

Alignment using RapMap, Stony Brook University **Fall 2015**

- The aim of this project was to align the multiple RNA-sequence reads to a full transcriptome.
- We worked on mappings of read given by open Source tool RapMap and efficiently generated aligned CIGAR strings by reusing the suffix arrays and hash tables of RapMap source code.
- Main challenge of this project was efficiency as single read could potentially be mapped to multiple locations in transcriptome.

Optimization of Speech Recognition System, NIT Trichy **May 2010-Jul 2010**

- Problem: Processing delay in real time speech recognition system results in bad user experience.
- We optimized the running time of the speech-recognition system implemented in C++ using linear assembly. This resulted in on an average 20% reduction in processing time without altering the detection accuracy.
- Linear assembly uses directives which lets assembly optimizer optimize the code by using efficient architecture specific functional units and registers.

Connect-Four & Peg-Solitaire Games, Stony Brook University **Fall 2015**

- Implemented Connect-four game using adversarial min-max & α-β pruning techniques.

- Developed Peg - Solitaire game using iterative deepening and A* search algorithms.
- Implemented various heuristic functions based on Manhattan distance/ Pagoda to minimize run time and memory footprint.

Attenuation estimation during rainy season, IIT Kharagpur **May 2011-Jun 2011**

- Problem: During rain, interruption because of glitches and bad signal is common in TVs.
- Implemented mathematical model for estimating the attenuation caused by various rain patterns.
- Demonstrated Proof-of-Concept of this model for Satellite TV & achieved improved feed-in signal quality.

INDUSTRIAL EXPERIENCE

Samsung Research Institute, Bangalore, India **Jun 2013-Jul 2015**

Senior Software Engineer

- Developed scaler for Pinch-to-Zoom feature. It performs real time scaling on input data using bi-cubic interpolation and guided filtering. The architecture handles streaming data using minimal amount of line buffers.
- Implemented SPIHT compression algorithm based on bit-plane tree of wavelet coefficients. Achieved upto 30% lossless compression factor.
- Optimized the run time of low power Imaging pipeline from 220ms to 90ms by exploiting multi-core processing on GPU. This is significant improvement because modern cameras suffer lag most.

Atmel R&D India Pvt. Ltd., Chennai, India **Jun 2011-May 2013**

Associate Design Engineer

- Worked in core group of System architects to define the I/O and memory map for ATtiny microcontroller. As a beginner, I supported in memory management specifically in cache performance analysis and enhancement.
- Implemented the asynchronous FIFO memory using Gray coded pointers for data synchronization.

HONORS AND AWARDS

Employee of the Month Award at Samsung India for significant contribution in Image compression algorithm development and implementation. My contributions are included in Samsung Galaxy Note4.