RAJESH KUMAR POLANI

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Professional Summary

- 3+ years of experience in programming using MATLAB
- 6 months of working experience using Python, Simulink and Verilog
- 2+ years of working experience using C, C++, C#
- Experience and good understanding of Object Oriented Programming and Design (OOP)
- Working knowledge in scripting languages PERL and Shell Scripting
- 6 months of experience in working with tools such as Cadence - Virtuoso, Encounter, Synopsys – HSPICE
- 2+ years of experience in working with Linux and Unix
- 1+ year of experience with database tools such as MySQL
- Excellent communication, problem solving and organization skills with high level of attention to detail

Work Experience

GroundMetrics, Inc. – Signal Processing Engineer and Programmer **Nov 2014 – Till date**

- Responsible for software development, data processing and data analysis in the field of Signal Processing
- Responsible for conceptualizing applications using Python, platform selection and wire-frame modelling
- Set up functionality, perform User Interface design, prototype development and revision testing
- Develop code, test and debug software applications
- Quality Control and systematic improvement of Software applications and work flow processes
- Developed signal processing function in Python viz. PSD, Noise, Coherence, Transfer Function, STFT and windowing technique
- Developed automated tools which play a key role in data collection, data analysis and data processing

The MathWorks - MATLAB Graphics Engineering Intern **May 2013 – Dec 2013**

- Worked on *Handling Graphics* part of upcoming MATLAB version **R2014b**
- Developed MATLAB scripts, capable of executing external codes from multiple diverse sources, capture screen shot of results viz. *figures, plots* and record error messages and warnings
- Identified new bugs and incompatibilities in the new release
- Compared and analyzed the results for visual differences in current and upcoming releases
- Analyzed warnings and error messages related to graphics

Tata Consultancy Services, India – Systems Engineer **Nov 2008 – Aug 2011**

- Responsible for handling two critical applications *Transfer* and *Receiving* for the client *The Home Depot*
- Worked on maintaining IT applications viz. *Inventory Management and Stores*
- Offered post production monitoring and maintenance support
- Identified root causes for many of recurring technical issues and provided robust solutions
- Automated day to day maintenance activities for the clients – *The Home Depot & JC Penney*
- Conducted and coordinated team meeting with clients
- Debugged many critical issues and gave permanent fixes
- Improved application performance and reduced technical related issues
- Has been a proactive team member and awarded *Rock Solid* by *JC Penney*

Academic Projects

Noise Suppression Algorithms for Cochlear Implant – INDEPENDENT STUDY

- Objective is to classify background and suppress noise to enhance hearing
- Continuous Interleaved Sampling, Advanced Combination Encoder and Wavelet Packet Transform used for decomposing the input signal picked by microphone
- *Noise Environment Detection* system is run in parallel to detect background noise in the input signal
- Gain is estimated and applied to suppress noise in the frame
- Input signal is analyzed and its envelope is extracted
- Modulated envelopes are applied to stimulate electrodes in the cochlear implant

Neural Network Classifier for signal modeling and classification

- Goal of project is to develop a classifier using Neural Network structure
- Designed and implemented Neural Network structure in ***'C'*** programming using *Backpropagation* algorithm
- Used *Gradient Descent Algorithm* to train and validate network structure and found an optimum configuration for signal modeling and classification
- Developed graphical user interface for user to set inputs parameters, desired output, hidden layers, hidden nodes in each layer, learning rate and to re-randomize

Comparison of Image Blur Reduction Techniques

Inertial Sensor Approach

- Developed and implemented inertial sensor approach using PSF and Wiener filter in MATLAB
- Generated Point Spread Function (PSF) for the blurred images
- Used PSF with Wiener filter to achieve de-blurred image
- Objective and Subjective analysis were done on the 50 resulting de-blurred images

Exposure Control Approach

- Used dark looking image with low exposure setting and blurred image with brightness and contrast.
- Adaptive Tonal Correction is performed by using the information in the blurred image to achieve de-blurring
- Tonal correction performs histogram shifting by moving the mean of the darker input image towards the brighter side of the histogram
- Objective and Subjective analysis were done on the 50 resulting de-blurred images

Design and Verification of a 16 Bit ALU using IBM 130 nm CMOS Technology

- RTL was designed and verified using *Verilog*.
- A library with 6 combinational gates and one flip flop was designed using *Cadence Virtuoso*. It was characterized and generated using *Liberty NCX*. The generated library was used as the target library to synthesize the design.
- The PnR was done using *Encounter* and Static Timing analysis was done using *Primetime*.
- Physical Verification was conducted and the spice netlist was extracted
- Functionality was verified through *SPICE* simulations using *HSPICE*

Spectral Shaping

- Objective is to find an estimate for desired signal from measured signal using NMLS Adaptive Filter
- Desired signal contained sinusoids with predefined amplitudes and frequencies
- Developed a MATLAB script to determine optimum impulse response and order by calculating MMSE
- Variance of the white noise was estimated using Pisarenko Algorithm

FIR Filter package

- Developed a user interface package in MATLAB to design linear phase FIR filters
- Involved design for Low Pass, High Pass, Band Pass and Band Stop filters
- User can choose filter type, windowing technique and specify filter parameters
- Implemented appropriate error handling and messaging system

Education

- MSEE - University of Texas at Dallas — Dec 2013
- BE, Electronics and Communication Engineering
  Anna University, Chennai, India — May 2008

Technical Skills

- **Languages** : MATLAB, C, C++, Python, C#, Verilog,
- **Tools Simulator** : Cadence - Virtuoso, Encounter, Synopsys - HSPICE
- **Database** : MySQL
- **Web Programming** : Shell Script, ASP.NET, ADO.NET, HTML
- **Application Software** : MS Office professional
- **Operating Systems** : Windows, UNIX, LINUX