Krusheel Munnangi

208 * Kailasa Giri Appts * 7th Cross * Nagavara Palya * Bangalore - 560093
Email: krusheel@gmail.com
Phone No: +91 9845978890

Objective:

Seeking for a position that provides an opportunity to apply Machine Learning and Natural Language Processing techniques on big data and also provides an environment for innovation and creation.

Summary:

- Developed innovative technologies, algorithms for Education, Human Computer Interaction, Paper Work Flow domains
- Skilled at progressing from problem statement to suitable algorithms
- Good knowledge of machine learning, image processing and signal processing
- Mentored interns and developers

Skill Set:

Programming Languages: Java, Pig, C++, C.
Tools: MATLAB, OpenCV
Scripting languages: Bash
Operating Systems: Windows XP, Linux

Areas Of Interest:

User Modeling, Data Mining, Machine Learning, Image Processing, Signal Processing

Education:

Master of Engineering (M.E), *Signal Processing* *(July 2007)*
Electrical Engg, Indian Institute of Science, Bangalore
CGPA: **7.0/8.0** (course work)
CGPA: **8.0/8.0** (project work) [*First Class with Distinction*]

Bachelor of Engineering (B.E), *Electronics and Communication Engg,* *(May 2005)*
College of Engineering, Andhra University
Percentage: **78.24** [*First Class with Distinction*]

Work Experience:

Kaybus India Pvt. Ltd, *(June 2013 – till now)*
Bangalore, India
Designation: Technical Specialist

Projects:

- **Relevancy of Recommendations** *(Jan 2015 – Feb 2015)*

  We would like to measure the recommendations that have been read by a user. Apart rom measuring the number that have been read, we would like to keep track of recommendations that haven't been read to modify the user profile.

  Role: Design and Developer
  Technologies: Spark, Scala and Java

- **Removal of Stale Documents** *(November 2014 – December 2015)*

  Recommendations are provided to a user. If a user is not viewing the recommendations that are given, these recommendations shouldn't be provided to the user for a certain period of time.

  Role: Design & Developer
  Technologies: Java, Spark

- **Time Tapering of User Profile and Other Improvements** *(Sept 2014 – October 2014)*

  Users profile is extracted based on the activity a user performs in the system. But all the activity is given equal weight irrespective of the time it was performed. With time tapering of activity, more weight is given to activity performed recently.

  Role: Developer
  Technologies: Java, Pig, Gradle

- **Recommendations As a Java Service** *(August 2014 – September 2014)*

  Recommendations logic which was part of rails has been moved to Java

  Role: Developer
  Technologies: Java

- **POC for Auto Sequencing of Documents** *(June 2014 – July 2014)*

  A sequence of documents is discovered which provides an order in which documents should be read.

  Role: Design and Developer

  - A minimum spanning tree based approach for detecting a sequence of documents has been proposed
  - Other variations of algorithms have also been tried

  Technologies: Java

- **Normalization of User Interest Model** *(March 2014 – April 2014)*

User Interest model based on FPM is biased towards those metadata patterns that are frequently published. We normalized the frequency of patterns with the publish frequency of a particular pattern.

Role: Developer
Technologies: Java, PIG

- **User Interest Modeling** *(October 2013 – Feb 2014)*

  User interests are modeled based on metadata of content with which user is associated. We used frequent pattern mining on activities of users to model interests of users.

  Role: Designer and Developer

  - Designed and developed a frequent pattern mining based algorithm for extracting a model for user.
  - Developed an algorithm for finding user interest model using Frequent Pattern Mining from Mahout library.
  - Developed algorithm using Pig and SPMF library in order for the algorithm to scale for large number of users.

  Technologies: Java, PIG

- **Taxonomy Generation and Mapping of Documents** *(June. 2013 – September. 2013)*

  Taxonomy of documents is an organization of documents based on topics in the document. Here we explored a semi-automated approach for building a taxonomy. Also we developed an approach for mapping of documents to topics in a taxonomy.

  Role: Designer and Developer

  - Define problem statement
  - Manual process for generation of taxonomy
  - Designed and Develop a semi-automated method for classification of documents to topics in taxonomy

  Technologies: Python, Java, Open NLTK

HP Labs India, *(November 2008 – April 2013)*
Bangalore, India
Designation: Research Consultant

Projects:

- **Automatic generation of PowerPoint Presentations** *(March. 2012 – April. 2013)*

  Autopoint is an automated system for generating slide presentations, given a topic of presentation or a document as input. It helps in easing the burden of generating the PowerPoint, which is an easy way of consuming large wiki pages or large PDF documents. We worked on generating the presentations for PDF documents. Generating

presentation for PDF documents involved extracting its document structure, selecting important sentences to be used for slides, removing redundant information from the sentences selected for slides and rendering the sentences and images onto slides.

Technologies: Java, C++, Matlab, Shell scripting.

- **Object Recognition for Houdini** *(July 2011 - Feb. 2012)*

  Houdini is envisioned as a table top setup with networking capabilities and allows interaction with objects of different kinds like books, content of books, toys, etc. It is supposed to fetch and project information associated with the objects in its view range. Recognizing objects in view range is the primary task which triggers further tasks of Houdini. We developed a base object recognizer and explored new approach for segmentation and large scale object recognizers for the problem.

  Technologies: C++, Matlab.

- **Hand Pose Recognition System with Depth Cameras** *(Aug. 2009 – June 2011)*

  Lately there is explosion of depth sensing devices, like kinect, having capability to give depth image of the scene. Availability of depth information simplifies the extraction of users from background, which in turn can be used for obtaining skeletal information of users. Depth imaging of the scene also makes it possible to develop robust algorithms to detect users' actions, enabling human computer interaction more intuitive. We worked on different problems of hand pose recognition system which are briefed below.

  Technologies: C++, Matlab, OpenCV.

  Sparse reconstruction framework based Hand Pose Recognition System *(Aug. 09 – June 10)*

  We developed a hand pose recognition system which exploits both the depth and color information available from kinect camera. A sparse reconstruction framework based classification method has been explored which is robust to occlusion and allows easy addition of new poses requiring only few samples from users. A prototype of the system is initially developed in matlab. Later the same system is developed using OpenCV.

  Technologies: C++, Matlab, OpenCV.

  Accurate palm segmentation from kinect depth data *(July. 10 – Nov. 10)*

  For accurate and robust recognition of hand pose, we require a neatly segmented palm region from torso and forehand. Initially, histogram of the depth information is exploited to segment hand region from torso. To segment out the forehand from palm region we used a region growing based method on depth image, which grows the region from the seed pixel based on the proximity in image space and depth values. Also, speed of the speed of region growing is improved by adding blocks of pixels to the region instead of pixel by pixel with almost similar performance.

  Evaluation of pose recognition system *(Nov. 10 – May 11)*

Evaluation of the hand pose recognition system is performed with SVM classifier on different features. Features explored are shape context features which exploit depth values. Also shape context features extracted from the edges and contours of palm from depth image are evaluated. Performances of different shape context features are evaluated with SVM as the classifier.

Optimization of region growing code *(May. 11 – June 11)*

Region growing code developed for extraction of palm from fore hand region is optimized for memory usage and computations.

- **Paper Widgets - Machine Readable Smarts** *(Nov. 08 – Aug. 09)*

Paper widgets are machine readable smarts similar to bar codes with features such as distributed placement, visual significant information and visually aesthetic. We used run length constrained codes to combat print scan channel interference and increase the data rate. Both encoder and decoder are initially developed in matlab and later converted to C.

Satyam Computer Services Ltd, *(July 2007– November 2008)*
Bangalore, India
Designation: Senior Software Engineer

Projects:

- **Modeling and Analysis of FTP Upload traffic in WLANs** *(Dec. 2007 – Oct. 2008)*

Usage of WLANs is flourishing. As the demand grows, there is also installation of infrastructure and increase in the number of users. In this we looked at the aggregate throughput of WLAN as the number of stations doing FTP upload increase.

- **Study of multiple antennas for cyclostationary spectrum sensing** *(July 2007 – July 2008)*

With increase in the number of users of spectrum, there is necessity for efficient usage of the available spectrum. Spectrum sensing is a technique which detects holes in the spectrum and should be very accurate in order to avoid interference for the primary user. Cyclostationary features provide better sensing capability even at low signal to noise ratio regime. In this we studied effect of multiple antennas at the cognitive terminal for cyclostationary features.

- **Implementation of time constrained viterbi algorithm for the keyword spotting system** *(Jan. 2008 – July 2008)*

In a keyword spotting system there will be word models to represent the keywords and garbage models to represent non keywords. Generally either phonetic models or acoustic sub word models are used for representing garbage models. During training of models and using those models for classification, there is tendency that number of frames in the decoded units will be large, which is not acceptable neither from physical process or

performance view point. So time constraints are used to limit the number of frames in the units decoded.

PROJECTS (Academic) :

Dissertation Title: *Out of Vocabulary word rejection in Automatic Speech Recognition*

***Abstract*:**

- A discriminative training method was proposed for the estimation of word models and impostor models in isolated word recognition case, which improves the rejection rate of out of vocabulary words.
- Segment skipping algorithm was developed and use of segment skipping algorithm for out of vocabulary word rejection in the case of continuous speech recognition was studied.

Academic Achievements:

- Recipient of GE Scholar and leader scholarship for 2005-07
- Secured All India Rank 3 in Graduate Aptitude Test in Engg. - 2005 out of 37,300
- Secured AIR 2689 IIT-JEE 2001
- Secured 292 rank in EAMCET 2001 of 150000

Publications:

1. Yogesh Sankarasubramaniam, **Krusheel Munnangi**, Serene Banerjee, Anjaneyulu Kuchibhotla,*Paper Widgets: Visually Aesthetic "smarts" for Document Images,* ICIP 2010, Hong Kong
2. **Krusheel Munnangi**, Joy kuri and Sridhar Gangadharpalli, *Performance Analysis of TCP Uploads in WLANs with Multiple Rates*, NCC 09**,** India.
3. Rajarshi Mahapatra, **Krusheel Munnangi**, *Cyclostationary Detection for Cognitive Radio with Multiple Receivers*, ISWCS 08, Iceland

Technical Reports:

1. Sankarasubramaniam Yogesh, **Krusheel Munnangi**, Subramanian Anbumani*, a Scalable System for Hand-pose Recognition and Learning*, HPL-2010-76, 2010
2. **Krusheel Munnangi**, Yogesh Sankarasubramaniam, *Constrained Coding for Print-Scan Inter-Symbol Interference*, HPL-2010-188, 2009
3. Yogesh Sankarasubramaniam, **Krusheel Munnangi**, Serene Banerjee, Anjaneyulu Kuchibhotla, Abhishek Chakraborty, and Bhushan Matad*, Paper Widgets: Intelligent Information Extraction from Paper Documents*, HPL-2010-189, 2009.