RAKESH TRIPATHI

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HIGHLIGHTS

- 8 years of Research and Product development experience in the domain of Data Analytics & Information Extraction using Machine Learning & Statistical techniques.
- Core skill in understanding the problems of feature extraction, clustering, and prediction. Hand's on experience in classifier design, Statistical modeling and implementing algorithm.
- Exposure to various Data Analysis softwares tools based on R, C++, MATLAB and Python.
- 3 years of Academic research experience and mathematical background in Linear Algebra, Statistics and Signal Processing during MS at Indian Institute of Technology Madras Chennai.

WORK EXPERIENCE

1. Tata Elxsi, Bangalore, India

Designation: Specialist, Machine Learning, Computer Vision

Duration: Feb 2015 - July 2015 (6 month)

Role: Creating Computer vision and Classifier pipeline for ADAS use cases.

2. Samsung Research and Development Institute, Bangalore, India

Designation: Technical Lead, Machine Learning and Analytics

Duration: May 2013 - Jan 2015 (1 year 9 months)

Role: Analytics software development and surveillance applications.

3. Rediff.com, Mumbai, India

Designation: Senior Research Engineer

Duration: January 2011 - April 2013 (2 Years 4 months)

Role: Data analytics for advertisement recommendation & Bidding System

4. Vubites India Pvt. Ltd. (100% Company of Rediff.com), Mumbai, India

Designation: Senior Software Engineer

Duration: June 2007- Dec 2010 (3 Years 6 months)

Role: Localized advertisement Insertion for DTV Broadcast. Algorithm formulation, design, coding, debugging.

Patent Filed:

1. Methods and apparatus for detecting unwanted intrusion into premises (For Samsung, 2014)
2. Methods and apparatus for splicing a compressed data stream (For Vubites, 2010)
3. Banner composition for TV feed (For Vubites, 2012)

Publications:

1. National Conference on Communications (NCC'07): R. Tripathi and R. Aravind, "Robust Facial Feature Tracking using Particle Filter with Shape and Texture Information".
2. International Conference on Pattern Recognition and Machine Intelligence 2007 (in Proceedings of LNCS Springer volume 4815/2007): R. Tripathi and R. Aravind, "Recognizing Facial Expression using Particle Filter based Feature Tracker".

Software Skill Sets:

Languages	: C, C++, Python, Core Java
Analytics Tools	: R, MATLAB, Pandas, StatsModel, Scikit, OpenCV, Elastic Search
Software Platforms	: Linux, Embedded system, Windows

Educational Qualifications

Degree	Institute	Specialization	Year of Passing	Percentage/CGPA
MS	Indian Institute of Technology Madras	Image Processing Pattern Recognition	2007	8.5
BE	Kumaon Engineering College, Almora	Electronics and Communication	2003	70.00%

Academic Research

MS Thesis : July 2005 - June 2007 "Facial Expression recognition"

Area of research : Computer vision and Pattern Recognition

Guide : Dr. R. Aravind, Professor, Dept. EE, IIT Madras

Abstract : The research goal is to classify facial expressions from face video clips. It involves feature extraction and classification. A new Particle Filter based tracker is developed to predict the motion of facial points in various conditions. Two classifiers are used, Hidden Markov Model (HMM) and Support Vector Machine (SVM).

Other project: January 2004 - June 2005

- Text mining & Topic Modeling projects under various courses.
- Object detection and classification on road in various category using Adaboost.

Work Experience Details: Projects Summary

Samsung R&D Center, Bangalore (May 2013 to Jan 2015)
Platform & Languages: Python, C++, R, ElasticSearch

Demand Forecasting for Mobile Retail Segment: Jan 2014 - Jan 2014

- Time series based trend forecasting of a mobile feature set from the historic consumption data of Samsung mobile phones and external sources. Socio-economic factors of a locality is statistically correlated with mobile features requirement for next 1-3 years.
- Average life span analysis of a mobile hardware, its OS and accessories such as battery, charger, headphone, protective cover etc using Markov chain and Random forest. Critical inferences are derived and dash boards are provided to different management audience.

Security and surveillance Applications: May 2013 - Dec 2013

- **Building spam filter:** Analysis of incoming mail and categorization based on **Multinomial Naive Bayes** classifier. Project involves filtering of text, building spam word corpora, and reporting of IP addresses for blocking purposes.

- **Categorization of Mail:** Work involving automatic detection of the importance of mail and putting them in different category such as project, notifications (SVN, Bug trackers), corporate circulars etc. Fusion of K-nearest Neighbourhood and Naive Bayes classifier is used.

Rediff.com, Mumbai (January 2011-April 2013)
Platform & Languages: C, C++, MATLAB

Advertisement Recommendation for a TV Industry: January 2011 - April 2013

- **Advertisement Recommendation:** Building clustering and prediction engine based on Intrinsic (generated from user viewing pattern via set-top box) and Extrinsic (geo-socio-economic data) parameters.
- Results are verified by direct (labeling) and indirect ways such as brand promotion and impact on users. Statistical tests are done to correlate the impact of a particular promotional activity on actual sales number or Brand impact.
- **Bidding System:** Creating base bidding cost system for a promotional slot of a TV Channel based on TRP information that includes quality and timing of a broadcasted program and locality information. Building bid defaulter identification system to reduce the bid cancellation rate (35% to 15%).

Vubites India, Mumbai (June 2007-Dec 2010)
Identification of Overlay area in TV channel: May 2010 - December 2010

- Identification of automatic banner positions and clear boundary demarcation in TV channel based on **Harris Corner Detector** and **Hough Transform**.
- Image resizing, pre-processing and selection of area of interest.

Banner Preserving Replacement of live DTV broadcast: January 2009 - April 2010

- Replacement of some part of live TV feed with another multimedia content preserving rest of the scene in the video (News Channel)
- **Compressed Domain Video Processing** for MPEG-2 and H.264 streams. Patent Filed for novel approach of design and performance.
- **Video content matching:** of a live TV feed with a pre-stored content and replacement with another feed. Main Challenge is to find translational and illumination invariant Image matching techniques.

Splicer And Ad Server development: June 2007 - December 2008

- Splicer is the core part of the overall software system, performs **seamless editing/replacement of live audio and video streams.**
- Audio-video synchronization: Packetization (TS and NAL) and time stamping (PTS/DTS) used to maintain the lip sync in content. Above engines (splicer, demux, remux) are integrated within **Gstreamer plugins**.
- **Ad server** is used to communicate between Advertisement uploader and scheduler, and Splicer which actually does the splicing. User can upload the multimedia content and bid for a slot. Adserver streams the content at given time slot to splicer.