Contact

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Top Skills

Natural Language Processing
Neural Networks
Deep Learning

Languages

English (Native or Bilingual)
Hindi (Native or Bilingual)

Publications

A Language Independent Approach to Audio Search

Out-of-Distribution Detection for Generalized Zero-Shot Action Recognition

Progression Modelling for Online and Early Gesture Detection

ProtoGAN: Towards Few Shot Learning For Action Recognition

Patents

DETECTION OF DRIVING ACTIONS THAT MITIGATE RISK

Vikram Gupta

Machine Learning Researcher | MBUX Intelligent Interior, Mercedes-Benz Research and Development India
Bengaluru, Karnataka, India

Summary

Computer Vision Researcher with experience in Natural Language Processing and Speech processing. My work has been published in CVPR, 3DV, ICCV and Interspeech.

Worked on Gesture Recognition, Few Shot/Zero Shot Activity Recognition, Image classification, Negative mining, Multilingual Audio Search, Semantic Similarity, Speaker Recognition, Time Series data mining.

In my previous life, I developed a strong foundation in full stack software development. I have developed micro-services, android games, android applications, web interfaces, elastic search based solutions and big data solutions (Hadoop).

Experience

Mercedes-Benz Research and Development India
Machine Learning Researcher
March 2018 - Present (2 years 1 month)
Bengaluru, Karnataka, India

Netradyne
Senior Research Engineer
August 2017 - February 2018 (7 months)
Bengaluru, Karnataka, India

Driving Behaviour Mining
Worked on mining actionable insights from the driving data of the fleets of our clients. Visual and Inertial data is captured by our devices installed in the vehicles. Used unsupervised clustering techniques over this data to cluster similar driving patterns (Hard braking, sudden acceleration) as well as extract new patterns. These driving patterns can be used to train the drivers and promote safe driving. Explored possibilities where the inertial data can be used as the golden source when visual algorithms fail.

Hard Sample Mining

Developed a Deep learning based prototype which can predict the video frames which are hard for an existing model to classify. Instead of labelling the complete data, only these hard frames should be labelled by the annotators. This helps in faster and cheaper annotation process without compromising on the performance of the computer vision models.

Self-Employed
Deeplearning Researcher
February 2017 - July 2017 (6 months)
Bengaluru Area, India

Explored Deep Learning and it's applications in the field of Computer Vision, particularly Object Identification.

Developed a good understanding of applying CNNs for object classification. Worked on standard datasets like CIFAR10, imbalanced medical dataset like Melanoma Cancer Dataset and also on client's proprietary datasets.

As a consultant for a startup, I developed models for detecting the age/ gender of a person. Also developed models for classifying cars into various categories.

In the process, I have explored various ideas to improve the accuracy of the models like deeper networks, dropout, local response normalisation, batch normalisation, pre-trained networks, data augmentation etc.

Kiwi India Private Limited
3 years 11 months

Senior Software Engineer - Machine Learning
October 2015 - January 2017 (1 year 4 months)
Bengaluru, Karnataka, India

As part of the Artificial Intelligence team, developed NLP solutions to enable creation of intelligent and smart bots.

Auto Reply

Developed an end to end Auto-Reply solution using deep LSTM encoder-decoder network. Trained and deployed Seq2Seq models on standard and custom conversational datasets.

Semantic Similarity
Developed an algorithm to find semantic similarity between two text phrases using advanced NLP techniques. Developed a custom algorithm to handle negations in text phrases by using constituency parse of the text.

Structured Question Answering
Developed a prototype of a Question Answering System for Structured Data.

Profanity Filters

The above solutions were exposed as REST APIs for the other teams to consume. The objective was to enable the bots to understand the intent of the users and give appropriate responses.

Earlier, I have been involved from the initial stages in the design and development of our flow based Bot making platform - onsequel.com.

Worked closely with the product managers,authors and UX designers to design and develop the core features of the platform including front end and backend.

Integrated ElasticSearch in the tool for providing advanced search functionality to our clients.

Also, worked on a demo chat application as a POC using QuickBlox on the Android platform.

Technologies: Torch, LUA, Play Framework, ElasticSearch, Java, Python, Hibernate, MySql, Redis, Angular JS, HTML, CSS

Software Engineer
March 2013 - September 2015 (2 years 7 months)
Worked as a full stack software engineer with specialization in developing high quality social games on Android over LibGDX library.

Integral part of the team which developed the famous game title "Westbound". Was involved from the conceptualisation phase till the release and maintenance of the game. Worked closely with the product managers, game designers and UI artists.

Designed and developed lot of addictive features and mini-games to enhance the overall game experience.

Solved complex problems and came up with design solutions for both client and server side.

Technologies: Java, Php, LibGdx, Kohana MVC framework, Android, Redis

Morgan Stanley
Technology Associate
September 2011 - March 2013 (1 year 7 months)
Mumbai Area, India

Worked as part of the backend team of the Investment Recommendation Engine. Involved in the understanding of the existing code base, underlying algorithm and the HADOOP framework.

Developed a Text Classification prototype with an accuracy of more than 93% using SVM classifier and TFIDF as the features.

Developed WCF web services for accessing data from the RTA DB2 database. Designed and developed UI modules using JQuery, Ajax, HTML and CSS.

Explored Microsoft Speech API to develop a speech to text conversion prototype. Developed an algorithm to interpret semantics from the text.

Indian Institute of Technology, Delhi
Research Associate - Speech Processing
June 2009 - January 2012 (2 years 8 months)
New Delhi Area, India

As part of my M.Tech project, I worked on "Language Independent Audio Search" under the able guidance of Prof.Arun Kumar, IIT Delhi, Jitendra Ajmera, IBM-IRL and Ashish Verma, IBM-IRL.

The objective of the research was to search and extract the audio files from a large database containing spoken keywords from a huge audio database without using any language specific information. We trained Neural Networks models on English language data and then evaluated our models on the same task on Hindi language.

We observed that neural networks are able to generalize well across languages without any language specific training.

The results were published in the 2011 INTERSPEECH conference -

http://www.isca-speech.org/archive/interspeech_2011/i11_1125.html

Voxta Communications
Text Independent Speaker Identification
May 2009 - July 2009 (3 months)

I worked as an intern with Voxta Communications under the able guidance of Sachin Joshi, Sirish Reddi and Tanmoy Mukherjee.

I developed a "Text Independent Speaker Identification" prototype using Gaussian Mixture Models (GMM) and Hidden Markov Models (HMM) obtaining accuracies of over 95% on more than 200 speakers.

Technologies: CMU Sphinx, Matlab, Perl

Loughborough University
Optically Switched Reconfigurable Antennas
May 2008 - July 2008 (3 months)

Pravak Cybernetics
Embedded Programming
October 2007 - March 2008 (6 months)

Developed a Graphics User Interface(GUI) for a six motor robotic arm.

Integrated a wireless transmitter receiver with a ATMEL Mega 16 micro controller.

Developed a line tracer robot using IR sensors and PIC microcontroller.

Visesh Infotecnics Ltd
Vehicle Tracking
May 2007 - July 2007 (3 months)

Education

Indian Institute of Technology, Delhi

M.Tech, Information and Communication Technology · (2010 - 2011)

Indian Institute of Technology, Delhi

B.Tech, Electrical Engineering · (2006 - 2010)