Anand Mohan

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EXPERIENCE

Amazon India — Bangalore, India
Applied Scientist - Alexa Speech — *July 2019 – Present*
- **Role**: Develop state-of-the-art speech recognition for Amazon Alexa platform.

Zoho Corporation Pvt Ltd. — Chennai, India
Member of Technical Staff - Site24x7 — *July 2015 – June 2016*
- **Role**: Part of client side development team for a full stack performance monitoring service - *Site24×7*.
- **Web Development**: Worked on 8 major and other minor releases including the release of a new *AngularJS* based web client for the product during my tenure.
- **API Development**: Built new *JAVA* based server APIs to facilitate data exchange with the web client.

EDUCATION

Indian Institute of Science — Bangalore, India
Master of Technology (M. Tech) in Systems Engineering. CGPA: 8.0/10 — *June 2019*

National Institute of Technology, Calicut — Calicut, India
Bachelor of Technology (B. Tech) in Electronics and Communication. CGPA: 7.75/10 — *May 2015*

Sarvodaya Vidyalaya — Trivandrum, India
Class XII — Indian School Certificate (ISC). Percentage Marks: 94.3 — *May 2011*

Sarvodaya Vidyalaya — Trivandrum, India
Class X — Indian Certificate of Secondary Education (ICSE). Percentage Marks: 90.8 — *May 2009*

PROJECTS

Attention Based Relevance Modelling for Speaker and Language Recognition — M Tech Thesis Project
Guide: Dr. Sriram Ganapathy, Indian Institute of Science, Bangalore — *May 2018 – Present*

Speaker Recognition
- **Problem Definition**: Given an enrollment and test utterance, verify the speaker in the enrollment utterance is present in the test utterance (2 class problem). The test utterance can contain multiple speakers.
- **SRE 2018 Challenge**: Top 20 in the *Speaker Recognition Evaluation(SRE)* challenge conducted by *National Institute of Standards and Technology(NIST)*, USA.
- **Relevance Modelling**: Frame level and segment level attention to weight the parts of the utterance which has relevant speaker information.
- **Short Sequence Modelling**: Modelling 1 sec. short sequence information with BLSTMs and attention.
- **GitHub**: https://github.com/anandmoghan/speaker-recognition

Language Recognition
- **Problem Definition**: Identify language(including dialects of same family) of a given test utterance (14 class problem).
- **Hierarchical GRU Modelling**: Stacking Gated Recurrent Units to build up context in a hierarchical fashion with attention weighting out-performed the state of art *i-vector* model at various duration levels and noise conditions.
- **One Second Modelling**: One seconds i-vectors from a Universal Background Model modelled with Gaussian Mixture Models passed to BLSTMs with attention also proved to be effective in the task.
- **GitHub**: https://github.com/iiscleap/lre-relevance-weighting

Natural Language to SQL Query — Natural Language Understanding
Guide: Dr. Partha Pratim Talukdar, Indian Institute of Science, Bangalore — *Mar. 2018 – Apr. 2018*
- **Problem Definition**: Given a query in natural language, the equivalent structured SQL query should be created. Aggregate and SELECT cases are classification problems while WHERE clause is a sequence to sequence problem.

- ○ **Sketch Model**: The SQL query is generated in three parts - Aggregate, SELECT and WHERE clauses. BLSTMs with column attention was used to generate the query.
- ○ **Results**: Was able to out-perform the Aggregate accuracy of the baseline *SQLNet* on the *WikiSQL* dataset.
- ○ **GitHub**: https://github.com/anandmoghan/nlq

- **House Prices - Advanced Regression Techniques** Practical Data Science
  Using regression models to predict house prices on Kaggle dataset. Jan. 2018 – Apr. 2018
- **Sparse Representation & Recovery of Graph Signals** B Tech Major Project
  Guide: Dr. G. Abhilash, National Institute of Technology, Calicut Aug. 2014 – May 2015
  - ○ **Graph Theory**: Studied properties of spectral graph theory and representation of real world signals as graphs.
  - ○ **Experimental Study**: Experimented on Graph Filters, Image Compression, Spectral Decomposition, Data Classification and Image Smoothing.
  - ○ **Data Classification**: Classified a set of images into two classes by representing them as graphs.
  - ○ **Graph Wavelets**: Implemented 2-channel perfect reconstruction wavelet filter banks using bipartite graphs.

PUBLICATIONS

- **Towards Relevance and Sequence Modeling in Language Recognition**
  Submitted to IEEE Transactions on Audio, Speech and Language Processing *2019*

- **Attention based Hybrid I-vector BLSTM Model for Language Recognition**
  Annual Conference of the International Speech Communication Association (INTERSPEECH) *2019*

- **End-to-End Language Recognition Using Attention Based Hierarchical GRU Models**
  IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) *2019*

- **The LEAP Speaker Recognition System for NIST SRE 2018 Challenge**
  IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) *2019*

M TECH COURSES

- Machine Learning for Signal Processing	- Pattern Recognition and Neural Networks
- Practical Data Science	- Natural Language Understanding
- Reinforcement Learning	- Linear and Non-Linear Optimization
- Data Structures and Algorithms	

SKILLS

- **Languages**: JAVA, Python, MATLAB, HTML5/CSS3, JavaScript, LaTeX.

- **Frameworks & Toolkits**: TensorFlow, PyTorch, Kaldi-ASR.

- **Operating Systems**: Linux, macOS.

LEADERSHIPS AND ACHIEVEMENTS

- **Student Placement Coordinator**
  Indian Institute of Science, Bangalore *2018 - 2019*

- **AIR 39, GATE 2017**
  Electronics and Communication Paper *2017*

- **Conducted Arduino Workshop for school students.**
  Sarvodaya Central Vidyalaya, Trivandrum. Website: arduinoforyou.weebly.com *June 2015*

- **Branch Representative (Elected)**
  Students Affairs Council, National Institute of Technology, Calicut. *2014 – 2015*

- **Registration Committee Manager**
  Tathva & Ragam, Techno-management & Cultural festivals, National Institute of Technology, Calicut. *2013 - 2014*