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 systems 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 Artificial Intelligence 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
- Practical Data Science
- Reinforcement Learning
- Data Structures and Algorithms
- Pattern Recognition and Neural Networks
- Natural Language Understanding
- Linear and Non-Linear Optimization

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*