DESH RAJ

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EDUCATION

Indian Institute of Technology Guwahati *June 2017*
B.Tech. in Computer Science & Engineering
Overall GPA: 9.35/10
Final year GPA: 9.69/10

PROJECTS

Sparse hierarchical skip thoughts Ongoing
Guide: Prof. Ashish Anand, Dept. of CSE

- The objective is to induce sparsity in skip-thought vectors for enhanced interpretability of embeddings
- Model uses online regularizers (RDA and FTRL) on top of the existing skip-thought algorithm
- Hierarchy in feature addition intended to represent high and low level semantics of the sentence

Irony detection in English tweets January 2018

- Used circular cross-correlation between tweet text and hashtags to model irony and transfer learning from pretrained DeepMoji model for in-text irony detection
- Achieved 70% accuracy on validation set in SemEval 2018 Task 3

Relation classification in biomedical text Bachelor Thesis
Guide: Prof. Ashish Anand, Dept. of CSE

- Implemented a novel CRNN model to learn long and short term dependencies and evaluated attention-based pooling
- Achieved state-of-the-art performance on two benchmark datasets (i2b2 and DDI) without any manual feature engineering
- Recently devised a Graph CNN model to leverage information from dependency parse of the sentence; this outperforms earlier model.

Spatial Transformer Networks Fall 2016
Guide: Prof. Arijit Sur, Dept. of CSE

- Used STNs for activity prediction from egocentric images
- Achieved performance comparable to state-of-the-art on GTEA and Intel Egocentric Vision datasets with extremely fast convergence.

Pattern recognition in multidimensional fuzzy sets Summer 2015
Guide: Prof. Frank Rhee, Hanyang University

- Proposed an algorithm to select multidimensional fuzzy membership functions according to data, using Wilcoxon's nonparametric tests
- Extended the method for high-dimensional data using dimensionality reduction approaches like PCA, kernel PCA, probabilistic PCA, and t-SNE
- Worked on improving clustering performance of fuzzy ART algorithm by integrating Interval Type-2 approach into vigilance parameter computation and improved classification results by 5-10%

EXPERIENCE

Samsung Research Institute Bangalore June 2017 - Present
Research Engineer *Bangalore, India*

- Conceptualized and implemented several key features like undo, selective delete, etc., as part of Context Engine team in Conversational Intelligence
- Devised a bit truncation method to reduce word embeddings size for on-device AI; achieved 75% compression with 95% correlation in word similarity task

Microsoft India May 2016 - July 2016
Software Development Engineering Intern *Hyderabad, India*

- Developed a cross-platform mobile application in Xamarin Forms for OEM digital contracting system
- Evaluated various notification services and implemented GCM for push notifications
- Conceptualized statistics APIs to improve business efficiency

PUBLICATIONS

Conference

- **D.Raj**, S.K.Sahu, A.Anand, *Learning local and global contexts using a convolutional recurrent network model for relation classification in biomedical text.* SIGNLL Conference on Computational Natural Language Learning (CoNLL) 2017. PP 311–321
- **D.Raj**, A.Gupta, K.Tanna, B.Garg, F.C.H.Rhee, *Principal component analysis approach in selecting type-1 and type-2 fuzzy membership functions for high-dimensional data.* In Proceedings: 17^{th} World Congress of International Fuzzy Systems Association 2017.
- **D.Raj**, B.Garg, K.Tanna, F.C.H.Rhee, *Visual analysis and representations of type-2 fuzzy membership functions.* In Proceedings: IEEE International Conference on Fuzzy Systems 2016. PP 550–554

Journal

- **D.Raj**, A.Gupta, B.Garg, K.Tanna, F.C.H.Rhee, *Analysis of data generated from multidimensional type-1 and type-2 fuzzy membership functions.* IEEE Transactions on Fuzzy Systems.
- S.Majheed, A.Gupta, **D.Raj**, F.C.H.Rhee, *Uncertain Fuzzy Self-organization based Clustering: Interval Type-2 Approach to Adaptive Resonance Theory.* Information Sciences 424 (2018). PP 69–90

ACHIEVEMENTS

Recepient of **INAE Travel Grant Scheme** by Govt. of India for oral presentation at WCCI 2016

Recepient of **Kalyani Research Scholarship** from Alumni Affairs (IIT Guwahati) for publishing at an international conference during B.Tech.

Offered **INSPIRE scholarship** by Dept. of Science and Technology, Govt. of India, for being among the top 1% in AISSCE-2013

TECHNICAL SKILLS

Programming Languages	Python, C, C++, Java, C#
Libraries & Frameworks	Tensorflow, Keras, PyTorch
Software	MATLAB, Visual Studio, Eclipse, Android Studio, LaTeX
Operating Systems	Linux, Windows