

Narendra Nath Joshi

Email: joshinarendranath@gmail.com | Website: <http://nnjoshi.co> | Phone: (614) 822-0733
GitHub: github.com/narendranathjoshi | LinkedIn: [linkedin.com/in/narendranathjoshi](https://www.linkedin.com/in/narendranathjoshi)

Experience

IBM RESEARCH AI (Research Engineer, AI/Machine Learning) Mar 2018 - present (Cambridge, MA)

- Trained convolutional neural networks for MNIST digit image classification and generated adversarial images to attack the CNNs and built a public demonstration illustrating the concept of CLEVER scores and how they relate to neural network robustness
- Trained chatbots with Watson Assistant, developed classifiers to detect egregious (outstandingly bad) conversations and built a public demonstration to showcase conversational breakdowns and how chatbots recover from bad conversations
- Mentored and worked with an intern on a deep learning project to generate text captions from labelled videos
- TECHNOLOGIES: Python, PyTorch, TensorFlow, scikit-learn, JavaScript

DISNEY RESEARCH (Research Intern, Summer) May 2017 - Aug 2017 (Pittsburgh, PA)

- Built a speech-based conversational agent for kids with responsive listening features like backchanneling (automatically saying 'uh huh' and 'hmm' during conversations)
- Worked on machine learning models for backchannel time and occurrence prediction, kids' emotion level prediction and turn-taking time prediction
- Evaluated human-likeness of the agent using conversations with 40 real kids aged 7-11 and obtained satisfactory results from human annotation evaluation despite automatic speech recognition challenges with this population
- TECHNOLOGIES: Python, Bash, openSMILE, scikit-learn

SENSARA TECHNOLOGIES (Product Engineer) Aug 2015 - Jul 2016 (Bangalore, India)

- Built an open, real-time semantic B2B search engine of television ads in Indian channels from Wikipedia and OMDb
- Implemented full-text and facet-supported search algorithms using information retrieval
- TECHNOLOGIES: Python, Bash, NLTK, Django, MySQL, Jinja, HTML/CSS

INTUIT (Software Engineer Intern, Co-op) Jan 2015 - Jun 2015 (Bangalore, India)

- Worked on maintaining and testing [mint.com](https://www.mint.com) REST APIs as part of Mint Platform team
- TECHNOLOGIES: Java, Bash

Education

CARNEGIE MELLON UNIVERSITY, SCHOOL OF COMPUTER SCIENCE Pittsburgh, PA

Master of Science, Intelligent Information Systems

Aug 2016 - Dec 2017

COURSES: Machine Learning, Language and Statistics, Advanced Multimodal Machine Learning, Machine Learning for Text Mining, Deep Learning, Search Engines, Lean Entrepreneurship

PES INSTITUTE OF TECHNOLOGY, DEPT. OF COMPUTER SCIENCE

Bachelor of Engineering, Computer Science

Bangalore, India
Sep 2011 - Jun 2015

Skills

- PROGRAMMING: Python, Matlab, JavaScript, Java, C
- MACHINE LEARNING/DEEP LEARNING: Keras, TensorFlow, PyTorch, Python scikit-learn, Stanford CoreNLP, Python NLTK, OpenCV

Projects

CONSISTENCY & VARIATION IN KERNEL NEURAL RANKING MODEL [Python, Keras, TensorFlow] Carnegie Mellon University

- Research project analyzing the Kernel Neural Ranking Model for search results using click log data from Sogou.com
- Created and conducted variance tests and determined latent matching patterns in the neural ranking model
- Developed improved ensemble search neural ranking models by studying word pair movements in word embeddings
- Achieved a 21% increase on NDCG@1, 14% increase on NDCG@3 and 14% increase on MRR compared to the original model

VISUAL QUESTION ANSWERING [Python, Caffe, Keras, TensorFlow] Carnegie Mellon University

- Implemented a deep learning system for visual question answering using the MSCOCO dataset and neural module networks
- Experimented with versions of CNNs (convolutional neural networks) for image processing and understanding and LSTMs for natural language processing and understanding
- Achieved 57.1% overall accuracy on the VQA challenge leaderboard compared to the state-of-the-art of 58.0%

AUTOMATIC GAP-FILL MULTIPLE CHOICE QUESTION GENERATION [Python, NLTK, Stanford CoreNLP] Carnegie Mellon University

- Used Wikipedia corpus and applied unsupervised techniques and word embeddings for multiple choice question generation with three wrong but convincing options
- Created a statistical automatic evaluation technique (QQS - Question Quality Score) for multiple choice question generation
- Obtained an average QQS of 71% on data sources like Harry Potter and research papers, verified against human annotators

DRIVER FATIGUE DETECTION SYSTEM [Python, OpenCV, NumPy, MongoDB, JavaScript, HTML/CSS] PES Institute of Technology

- Computer Vision based project focused on real-time driver fatigue detection by video processing on face
- Detected yawns and measured eye blink durations and frequencies to determine if the driver was drowsy
- Achieved 89.3% accuracy and 97% recall on 27 real volunteer drivers, was judged Best Capstone project for social impact

Publications and Conferences

- Driver fatigue detection system. *Signal and Image Processing (ICSIP), IEEE International Conference on Signal and Image Processing (ICSIP)*. IEEE, 2016.
- Consistency and Variation in Kernel Neural Ranking Model. *International ACM SIGIR Conference on Research & Development in Information Retrieval. SIGIR '18*
- BigBlueBot: Teaching Strategies for Human-Agent Interaction. *Neural Information Processing Systems 2018 Demonstrations*