Hitesh Golchha

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Education

University of Massachusetts Amherst **Amherst, MA**
M.S. Computer Science 2021–2023
Coursework: Adv NLP (685), Reinforcement Learning (687), Neural Nets - Vision (682), Prob. Graphical Models (688), ML (689), Independent Study (696), Algo for Data Sc (514), Applied Stats (501), Distributed OS (677)

Indian Institute of Technology Patna **Patna, India**
B.Tech. Computer Science and Engineering 2014–2018
Coursework: AI, NLP, Deep Learning, Intelligent Visual Surveillance Systems

Skills

Programming Languages: Proficient: Python. Familiar: C, Java, C++, Matlab, HTML, CSS, PHP, SQL
Libraries/Frameworks: Proficient: PyTorch, Tensorflow, Keras, Numpy, Scikit-Learn, Matplotlib, Spacy. Familiar: Django, AWS Services (S3, SageMaker, EC2, Lambda, IAM Roles, Cloudwatch)

Publications

Courteously yours: Inducing courteous behavior in customer care responses using reinforced pointer generator network. **Golchha H**., Firdaus M., Ekbal A., Bhattacharyya P. **NAACL-HLT 2019**

Helping each Other: A Framework for Customer-to-Customer Suggestion Mining using a Semi-supervised Deep Neural Network. **Golchha H**., Gupta D., Ekbal A., Bhattacharyya P. **ICON 2018.**

A Deep Multi-task Model for Dialogue Act Classification, Intent Detection and Slot Filling. Firdaus M., **Golchha H**., Ekbal A., Bhattacharyya P. **Cognitive Computation 2020**

Experience

UMass Information Extraction and Synthesis Laboratory **Amherst, USA**
Grad Research under Prof. Andrew McCallum Feb 2022 – Now

- **Text-based Games using RL** : Using LLMs, RL and Contrastive Learning for playing text-based science games.
- **Energy based models for Multilabel Classification**: Exploring architectures for Energy Based Models for Multilabel Classification which can model contextual label dependencies.

Amazon **Seattle, USA**
Applied Scientist Intern June –August 2022

- **Product Similarity for Export Eligibility** Designed probe tasks and compared product embeddings from vision and text-based models for export eligibility related tasks relevant to Amazon Global Store. Proposed supervised contrastive framework to train export eligibility centric embeddings. Also made contributions to other ML projects within the team performing diverse subset sampling.

Flipkart **Bangalore, India**
ML Engineer Apr 2019–Apr 2021

- **Natural Language Understanding for E-commerce Voice Assistants** serving millions of Hindi & English users:
  Entity Extraction: BERT, CharCNN, Word Bi-LSTM models. Improved accuracy by 3.5% to 90%
  Intent detection: Handle class imbalance, miscalibration (Focal Loss), Robustness (Noisy augmentation, translation, backtranslation), Misprediction between unrelated classes: (Hierarchical cross entropy using intent class taxonomy). 93% accuracy.
  Multi-intent sentence segmentation: Clause boundary prediction (90+% accuracy)
  Rescore ASR beams using NLP features

AI-NLP-ML Lab, IIT Patna **Patna, India**
Junior Research Fellow May 2018–Dec 2018

- **Courteous Style Transfer for Conversational Agents (NAACL-HLT'19)** Attention based seq2seq model, with Pointer Generator Network for copying mechanism.Decoder conditioned on conversation history (with Emoji embeddings). Trained using Max Likelihood Estimation + REINFORCE with Baseline.
- **Joint Intent, Dialog act and Slot detection** Tried Character embeddings, self-attention, linguistic embeddings, and different encoders. Tried alternating training methods for multi-domain training

NLP Lab, Bar-Ilan University **Ramat Gan, Israel**
Research Intern under Prof. Ido Dagan June 2017–Aug 2017

- **Proposition Coreference resolution for Natural Language Knowledge Graphs** Online clustering algorithm based on pairwise comparison of propositions. Features used: fuzzy string matching, wordnet synset overlap, and presence of entity coreference between arguments. Improved existing CONLL from 0.56 to 0.65

AI-NLP-ML Lab, IIT Patna **Patna, India**
Undergraduate Research May 2016–May 2018

- **Customer-to-Customer Suggestion Mining (ICON'18)** Semi-supervised learning approach using self-training over a Deep classifier. Features from : LSTM - attention, CNN Encoder, Linguistic features. 65.6% and 65.5% F1 on highly imbalanced datasets, better than previous approaches and ablations
- **Question Answering from Wikipedia articles** Detect answer sentences from Wikipedia articles on the WikiQA dataset. MLP over the question and potential answer features encoded by LSTM network.

Academic Projects/Research

Code Explanation Generation *'CS685 Adv Natural Language Processing, Prof. Mohit Iyyer'*
Finetuning CodeT5 for generating explanation for a piece of competitive programming code and its question.

Deep RL for Continuous Control *'CS687 Reinforcement Learning, Bruno Castro da Silva'*
Implemented Vanilla policy Gradients with different baselines, approximating a Gaussian policy and Value function with two layer neural nets. Evaluated on Pendulum-v1 and ContinuousMountainCar-v0.
Assignments also included implementing classic algorithms for policy evaluation/search: Cross-Entropy method, Value Iteration, Monte Carlo, TD-Learning, SARSA, Q-Learning.

Calibrating Intent Detection Models with Focal Loss and Temperature scaling*'CS682 Neural Networks, Prof. Erik Learned-Miller'*
Used Temperature Scaling and Focal loss to calibrate BERT-base models fine-tuned for joint Intent detection and Entity Extraction for the Project. Implemented Batch Norm, Dropout, CNNs, RNNs, and GANs in assignments.

RFID and Cloud based entry exit system*' CS421 Computer Peripherals and Interfacing, IIT Patna'*
Team of two. Developed an RFID based entry exit system. The server and database was hosted on cloud9 and we interfaced the RFID card sensors, LCD display and keypad matrix with Raspberry Pi.

Edubee: An Educational Website*'CS203: Software Engineering, IIT Patna'*
Team of six. Website allows anyone to design and host their own course with videos, assignments, projects and online coding problems. Lead the team, implemented the search, participated in design.