Amey Hengle

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Research Interests: Applied Machine Learning, Natural Language Processing, Multilingual Learning, Social Media Analytics.

EDUCATION

Savitribai Phule Pune University (PVG's COET)
Bachelors in Computer Engineering 2016-2020
Major GPA: 8.53/ 10

RESEARCH AND INDUSTRY EXPERIENCE

1. Research Assistant Aug 2020 -Feb 2021

| CS Department, PVG's college of engineering | *Advisor: Prof. Manisha Marathe*

- Researched and published two academic papers in a premier NLP conference (EACL).
- Proposed a novel document representation strategy, combining representations from RoBERTa and LDA using a denoise-autoencoder.
- Employed clustering algorithms of HDBSCAN and KMEANS to identify the latent themes of discourse in online mental health communities.

2. Research Intern (NLP) Aug 2020 -Dec 2020

| Optimum Data Analytics

- Developed an attention ensemble CNN-BiLSTM model Marathi text securing 1st rank at the TechDOfication Shared Task-1f. Published the work as a research paper at the ICON-2020 conference.
- Developed a retrieval-based chatbot using DialogFlow, Flask and Firebase. Integrated a psychological stress scale with DialogFlow responses and improved the data-processing pipeline by caching user-conversations.

3. Capstone Project Intern May 2020 -July 2020

| Optimum Data Analytics

- Worked on a Deep Learning and IoT-based assistant ,combining the multiple features of Face Recognition, Image Captioning, Text Recognition (OCR) in an embedded system.
- Implemented face recognition using opencv, Image captioning using attention-based encoder-decoder model and OCR using Google vision. Deployed the face-recognition model on an ubuntu web server using Flask, Javascript and Ajax.
- Wrote a research paper and published the work at the ICSSIT-2020 conference.

4. Python Developer Intern Aug 2020 -Feb 2021

| Schlumberger

- Developed an application software for automating data pipelines in SAP using REST, Postman and TkInter.

PUBLICATIONS

1. Cluster Analysis of Online Mental Health Discourse using Topic-Infused Deep Contextualized Representations. (under publication)
2. Combining context-free and contextualized representations for Arabic sarcasm detection and sentiment identification. (under publication)
3. An Attention Ensemble Approach for Efficient Text Classification of Indian Languages [preprint]
4. Smart Cap: A Deep Learning and IoT Based Assistant for the Visually Impaired. [paper]

PROJECTS

1. **A Hybrid transformer model for irony detection.**
- Developed a deep multi-channel hybrid model to detect irony and sentiment in Arabic Tweets.
- The system secured the **2nd** rank at the WANLP-2021 sarcasm detection task. [Project]

2. **Attention-ensemble model for Marathi text classification.**
- Implemented a CNN-BiLSTM parallel architecture with attention mechanism to classify short paragraphs in Marathi language into their respective technical domain.
- The system secured **1st** rank in ICON-2020 subtask-1f. [Project]

3. **Combining BERT and LDA using autoencoder for improved clustering of social media posts.**
- Employed a denoise-autoencoder model to combine contextualized sentence representations (BERT) and topic models (LDA), to identify latent themes pertaining to mental health discussion groups on Reddit.
- Performed clustering using HDBSCAN and dimensionality reduction using UMAP. [Project]

4. **Smart Cap: AI powered visual assistant**
- Built a Deep Learning and IoT-based visual assistive device. Developed Face- Recognition using openCV, Image Captioning using an Encoder-Decoder Attention model and Text-Recognition (OCR) using Google Vision. [demo]

5. **BuddyBot: A chatbot system for stress detection**
- Implemented a retrieval-based conversational agent using DialogFlow, Flask and Firebase as a part of my internship project. [demo]

6. **Dynamic Ship-Routing algorithm**
- Developed a graph-based strategy to connect all lat-long coordinates in a shipping lane.
- Used beam-search to find the best inter-node route between two ports. [Project]

- Deployed existing API servers on Google Apigee using Javascript and REST.

TECHNICAL SKILLS

- **High proficiency**: Python, Tensorflow, DialogFlow, Pandas, Numpy, Scikit-learn, SciPy, MYSQL, NLTK, Spacy, Matplotlib. Flask, Firebase.
- **Familiar:** Pytorch, Java, Javascript, Android, MongoDB, BeautifulSoup, C++.
- **Tools/Frameworks:** Git, Android Studio, Postman, LaTex, Webhook, Linux.

ACHIEVEMENTS

- Secured 1st rank in ICON TechDOfication shared task.
- Selected in the top-8 teams (out of 30k participants) at ZS healthcare innovation competition.
- Secured 2nd rank in WANLP-ArSarcasm shared task.
- Runner-up at the ASPIRE-2020 national level project competition.

7. **Nautical-calculations**
- Implemented the mathematical geo-spatial calculations like nautical distance, bearing angle and rhumb-line distance in python. [Project]

RELEVANT COURSES

- **Machine Learning**: Artificial Intelligence and Robotics, Advanced Machine Learning, Applied Natural Language Processing (online) , Deep Neural Networks (online), Tensorflow (online).
- **Computer Science**: Data Structures, Algorithms, OOP, Cloud Computing, Evolutionary Computation, Data Analytics, High Performance Computing, Graph Theory.