

Akshat Choube

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RESEARCH INTERESTS

I am interested in studying and building intelligent systems that understand human communication and behavior patterns.

EDUCATION

University of Southern California, Los Angeles Master of Science in Computer Science (Honors)	GPA: 3.94/4.0	August 2019 – May 2021
Indian Institute of Technology (IIT), Palakkad Bachelor of Technology in Computer Science and Engineering	GPA: 8.89/10	August 2015 – April 2019

WORK EXPERIENCE

SDE (ML) Amazon Search <i>Using ML and NLP to understand search intents in customer queries on the Amazon website</i> <ul style="list-style-type: none">• Worked on different NLP methods to increase query parsing coverage for a Gazette-based Linker.• Generated distributions for price and shipping speed of products shown for customer queries based on customer behavior. This is used in the product ranking.• Worked on understanding media intent in queries using a multi-lingual multi-intent BERT-based model.• Working on a customer-facing experiment to change autocomplete experience by showing related keywords for a typed prefix.	July 2021 – present
Graduate Research Assistant Interactive Human Perception Lab, USC <i>Worked on predicting mood using apple watch data</i> <ul style="list-style-type: none">• Worked on mood prediction using heartbeat and exercise data from apple watch.• Did statistical analysis and used deep learning models to understand the correlation between mood and apple watch data.	Jan 2021 – May 2021
Teaching Assistant Viterbi School of Engineering, USC <i>TA for Applied NLP (CSCI-544)</i> <ul style="list-style-type: none">• Conducted regular office hours to help students with NLP theory, project, and report writing.• Corrected students' test papers and held sessions to brainstorm ideas for their projects.	Jan 2021 – May 2021
SDE Intern Amazon Search <i>Spark Based Data Processing Framework</i> <ul style="list-style-type: none">• Designed and implemented a framework to convert multiple offline user behavior and clickstream datasets into read-only database (RODB) which can be deployed on an online search service.• The framework provides custom data preprocessing options like filtering, transformation, aggregation, and merging.• The RODB file generated from the framework reduces overall search latency.	June 2020 – Aug 2020
Graduate Research Assistant Social Media Analytics Lab, Keck School, USC <i>Using Natural Language Processing for Public Health</i> <ul style="list-style-type: none">• Analyzed Twitter for conversations, marketing, and misinformation around tobacco products (like cigarettes, cigars, etc.) and cannabis products (like weed, hash etc.).• Analyzed the roles of social bots in spreading misinformation and promoting hazardous products.• Conducted analyses on predominant health effects of cannabis use on Twitter.	Sept 2019 – Jan 2021
Summer Intern Divum Labs <i>Using Blockchain for ecommerce</i> <ul style="list-style-type: none">• Modified Merkle Patricia trie in Ethereum framework to allow for ecommerce data storage in blockchain.• Represented ecommerce data from blockchain as Knowledge Graph and applied machine learning algorithms on it.• Compared Graph databases like Neo4j and Dgraph for performances on read, write, and query search operations.	May 2018 – July 2018
Junior Research Fellow Tata Institute of Fundamental Research <i>Information exchange system involving bit packets</i> <ul style="list-style-type: none">• Defined Quality of Service considering transmission time and fraction of a bit packet.	May 2017 – Dec 2017

- Proved optimal order for transmission of packets and devised a greedy algorithm that performs at most twice worse than intractable optimal solution.
- Published and presented this work at National Conference on Communications (NCC 2018) ([link](#))

PUBLICATIONS

- [1] **Akshat Choube**, Mohammad Soleymani, “Punchline Detection using Context-Aware Hierarchical Multimodal Fusion”, International Conference on Multimodal Interaction (ICMI), 2020.
- [2] Rahul Vaze, **Akshat Choube**, Shreyas Chaudhari, Nitin Aggarwal, “Energy-Delay-Distortion Problem”, National Conference on Communications (NCC), 2018.
- [3] Jon-Patrick Allem, Allison Dormanesh, Anuja Majmundar, Jennifer Unger, Mathhew Kirkpatrick, **Akshat Choube**, Aneesh Aithal, Emilio Ferrara, Tess Cruz, “Topics of nicotine-related discussions on Twitter: quitting, withdrawal, and hypnotherapy”, Journal of Medical Internet Research (JMIR)

PROJECTS

Persona and Emotion Aware Dialogue System

- Created a new dataset by augmenting the PERSONA-CHAT dataset with discrete emotions for utterances using deepmoji network.
- Finetuned GPT-2 on the new dataset to generate a response given the persona of the agent, dialogue history, and desired emotion of the response.
- Analyzed the interplay between emotion and persona of the agent by varying intensity and label of emotions.

Multimodal Punchline Detection

- Designed context-aware hierarchical network for the task of multimodal punchline detection in TED Videos.
- Demonstrated the ability of hierarchical fusion to learn multimodal interactions for humor.
- Achieved state-of-the-art accuracy on UR-FUNNY Dataset and published the work at ICMI 2020 ([link](#)).

Analyzing Happy Moments

- Designed and implemented a Sentiment Analysis study to understand true sources of happiness among people of different culture, sex, age, etc. based on HappyDB dataset containing 14K happy moments.
- Built a word cloud generator to better visualize data based on query given by user.
- Classified happy moments into 7 categories like Affection, Achievement, etc. using LSTM and achieved 81% accuracy.
- Developed a valence scoring algorithm for sentences considering contextual valence shifter words like not, barely etc.

Multiview Face Synthesis using Generative Adversarial Network (GAN)

- Studied, implemented, and compared existing Multiview face generation models like CR-GAN, DR-GAN, TP-GAN, and GANnotation.
- Implemented a distributed version of CR-GAN using PyTorch to train in multiple CPU/GPU environment.

Intelligent Document Summarizer

- Created a Python application that gives a summary of a large text document that best describes the document.
- Devised an algorithm that works by clustering sentences and choosing the ones with maximum tf-idf cosine similarity score within the cluster.

Expert Paper Recommendation System

- Designed a recommendation system that assigns papers to experts for reviewing in a conference.
- Developed an algorithm that learns an expert's domain of work from their papers and recommends them papers in same domain.

TECHNICAL SKILLS

- **Programming Languages:** Python, C, C++, Scala, Haskell, C#, Go, HTML, CSS
- **Database:** MySQL, MongoDB, Dgraph, Neo4j
- **Frameworks/Tools:** PyTorch, NLTK, Spark, Keras, TensorFlow, Visual Studio, LaTeX, Git, Matlab, ArcGIS

EXTRA-CURRICULAR ACTIVITIES

- Managed corporate relations for Dept. of Computer Science, IIT Palakkad and secured 100% recruitments.
- Conducted practical sessions on Machine Learning and AI for 70+ teachers as part of the Additional Skill Acquisition Programme.
- Taught 50+ underprivileged students as part of National Service Scheme (NSS) and motivated them to pursue science.