Anirudh Achanta

achanta.anirudh@gmail.com
+1(612)701-8352

github.com/achantaa
Google Scholar

Education

- **University of Minnesota – Twin Cities** — **Sep. 2021 - May 2023 (expected)**
  M.S. Computer Science, GPA: 4.0/4.0 — *Minneapolis, USA*
- **Birla Institute of Technology and Science, Pilani** — **Aug. 2016 - Jul. 2020**
  B.E. Computer Science — *Hyderabad, India*

Publication

- Saxena, P., Naresh, M., Gupta, M., **Achanta, A.**, Kota, S., & Gupta, S. (2020, December). NANCY: neural adaptive network coding methodology for video distribution over wireless networks. In *GLOBECOM 2020-2020 IEEE Global Communications Conference* (pp. 1-6). IEEE.

Relevant Coursework

Computer Vision	Artificial Intelligence	Data Mining	Advanced Machine Learning
Parallel Computing	Information Retrieval	Object-Oriented Programming	Data Structures and Algorithms

Research Projects

- **Adaptive Bitrate Algorithms using Deep RL for Streaming**
  Department of CSIS, BITS Pilani - Hyderabad
  - Modified and trained existing Deep Reinforcement Learning models to generate ABR algorithms to compare and test performance under lossy network conditions
  - Network emulation and packet dropping was achieved using MIT's Mahimahi emulator and packet losses from 0 – 5% were tested in intervals of 0.2% at various rates of delay
  - QoE Metrics of state-of-the-art Deep RL-based ABR algorithms such as Pensieve were shown to be superior even in conditions where there were no losses
  - Proposed an extension to these ML-aided techniques by leveraging network coding to ensure lower packet losses during video streaming

Course Projects

- **Uncertainty-Aware 3D Object Detection**: Object Detection in 3D with `TensorFlow 2`, incorporating measures of bounding box and orientation uncertainty on the KITTI Cars Moderate and Hard dataset. **Increased mAP by 2% (to 94%)** on KITTI Hard for Bounding Box and Average Orientation Similarity.
- **Data-augmented Image Classification with Model Explainability**: Image Classification with `PyTorch`, using `Albumentations` for data augmentation on Garbage Classification and Cats vs Dogs datasets, followed by model interpretability analysis with Captum.ai's gradient-based and occlusion-based attribution methods.
- **Dueling Double Deep Q-Networks with Atari Games**: `TensorFlow 2` Dueling DDQN network with Prioritized Experience Replay Buffers for Reinforcement Learning on the Atari 2600 game Ms. Pacman.
- **R-CNN 2D Object Detection**: R-CNN model in `TensorFlow 2` using `OpenCV`'s Selective Search algorithm. Trained and tested 2D bounding box generation on the RESISC45 dataset containing aerial imagery of airplanes on the ground.
- **NFL Yards Prediction**: Comparison of various Machine Learning models including XGBoost, Naive Bayes, Random Forests and SVMs for predicting and classifying the yards gained in NFL rushing plays. Leveraged K-Means clustering for grouping similar players together.
- **Search Engine**: Vector-Space model search engine to search through thousands of NASA Publications; parsed raw XML data and used TF-IDF for term weights, creating n-grams and tokens with nltk.

Work Experience

- **Zscaler** **May 2022 – present**
  Intern, Zscaler Digital Experience (ZDX) *San Jose, CA*
  - Developed Machine Learning models for time-series analyses of network performance data to find and group similar users; aggregated group level statistics to highlight key similarities
  - Implemented HDBSCAN clustering on device hardware and software information with UMAP dimensionality reduction
  - Built APIs to integrate the similarity models with existing services, enabling real-time usage by users
  - Refactored existing ZDX APIs to leverage `Pandas` and `NumPy`, improving both readability and performance

- **Amazon** **Aug. 2020 – Aug. 2021**
  Software Development Engineer, Emerging Payments *Bangalore, India*
  - **Amazon PayCode**:
    - **Italy Launch**:
      - Worked on developing core payment Java APIs to enable the launch of 'Paga in Contanti' (Pay with Cash) on Amazon.it with complete unit and integration testing
      - Redesigned the notifications experience for Amazon PayCode across e-mail, SMS and Android/iOS Push Notifications in JavaScript – successfully deployed across 4 marketplaces
    - **PayCode New API Design**: Designed and created new API specifications for Amazon PayCode by consulting various stakeholders to enable seamless integration with new partners, while ensuring backwards compatibility
    - **PayCode Sandbox**: Implemented an API sandbox using AWS API Gateway, AWS Lambda and DynamoDB for PayCode clients to test – used for successful integration with 2 new partners
  - **Payments – Accounting Acceleration**:
    - Worked on multiple internal full-stack web applications with Java, TypeScript and React to prevent accounting integration issues with external partners before key payment method launches
    - Designed a new format for Remittance files for reducing integration time with banks and held key discussions with multiple teams and stakeholders across the Payments pipeline for successful agreements

- **Amazon** **Aug. 2019 – Dec. 2019**
  SDE Intern, Emerging Payments *Bangalore, India*
  - Developed the full-stack architecture towards the launch of a new cash-based payment method on Amazon.com
  - Worked to create RESTful Java APIs based on the Spring MVC framework with full coverage JUnit testing

Technical Skills and Certifications

- **Programming Languages -** Python, Java, C, C++, MATLAB, TypeScript
- **Machine Learning Libraries -** `TensorFlow`, `PyTorch`, `NumPy`, `scikit-learn`, `Pandas`
- **Cloud Frameworks - AWS**: Lambda, S3, API Gateway, DynamoDB, SQS, SNS; **Azure**: Azure Data Explorer (ADX)
- **MOOCs -** Robotics: Perception (UPenn), Fundamentals of Scalable Data Science (IBM), Data-driven Astronomy (The University of Sydney)

Awards

- **National Talent Search Scheme (NTSE)** Government of India
- **Kishore Vaigyanik Protsahan Yojana (KVPY)** Indian Institute of Science, Bangalore