Abhay Zala

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EDUCATION

Computer Science Major (B.S.)
Statisitics and Analytics Minor
Data Science Minor

University of North Carolina at Chapel Hill
Expected Date Earned: May 2022

Computer Science (M.S.)

University of North Carolina at Chapel Hill
Expected Graduation: May 2023

PUBLICATIONS

ArraMon: A Joint Navigation-Assembly Instruction Interpretation Task in Dynamic Environments
https://arxiv.org/abs/2011.07660

FixMyPose: Pose Correctional Captioning and Retrieval
https://arxiv.org/abs/2104.01703

SKILLS

- Python, Java, C#, C/C++
- Git, Github
- Docker, Kubernetes, Linux
- AWS, GCP, GKE, IBM Cloud
- NodeJS, PHP, SQL
- HTML5, CSS3, JavaScript/jQuery
- PyTorch, NLP / Machine Learning
- Google Firebase
- Unity Game Engine, OpenGL
- Microsoft and Adobe Software Suites
- Web/Mobile/Desktop App Development

RELEVANT COURSEWORK

- Algorithms and Analysis
- Data Structures
- Modern Web Programming
- Programming Language Concepts
- Java Programming
- System Fundamentals
- Computer Organization
- Models of Langauge and Computation
- Special Topics in Computer Science
- Foundations of Statistics and Data Science
- Introduction to Probability
- Discrete Mathematics
- Calculus I, II, III

ABOUT ME

Six plus years of web and application development experience. Earned many awards at hackathons. Undergraduate Research Assistant at the nationally recognized the MURGe-Lab (UNC-NLP Group). Strong skills in several programming languages and technologies. Official logo designer for the newly created Association for Computational Linguistics (ACL) Mentorship Program.

EXPERIENCE

AI Researcher Summer Intern, UNC 2020 (May - August)

- Developed AI model with **PyTorch** to interpret language instructions and perform robotic actions
- Setup simulation environment in **Unity** with **C#** and hosted on **Amazon Web Services (AWS)**.
- Created a new dataset (7.7k task instances and 30.8k NLP instructions) for multi-modal models.
- Presented several baseline models (integrated and biased) and their performance on metrics (nDTW, CTC, rPOD, PTC).
- Successfully demonstrated a large performance gap between humans and models in a new task that presents a wide scope for future work.
- Awarded with research paper being accepted into prestigious EMNLP Conference Findings.

Undergraduate Research Assistant, UNC 2019 (September) - Present

- Drove new **NLP** and **ML** ideas at the nationally recognized MURGe-Lab at the University of North Carolina at Chapel Hill (UNC).
- Working on integrating NLP with other fields such as **Computer Vision** and **Embodiment**.
- Created new tasks for multi-modal models and several baselines models to prove their validity.
- Analyzed models on existing metrics as well as several new metrics.
- Created two large datasets of several thousands of NLP instructions and images, along with simulation environments for multi-modal models.
- Presented research work at the EMNLP and AAAI conferences.
- Published two papers in the field of Language and Vision.

PROJECTS

- Built a VR training system for healthcare workers
  - **Won 1st place** (Best use of AR/VR for healthcare) at the HackReality 2021 Hackathon.
  - Allows people that require lab equipment training to learn from home and without risk.
  - Uses **Unity/C#** to create interactions with virtual patients to assist in worker training.
- Built a social media platform that enables networking and message sharing
  - **Won 1st place** (Best use of GCP), **2nd place** (Best Hack for Accessibility / Inclusivity) and the **Wolfram Award** at the HackNC 2020 Hackathon.
  - Containerized and deployed web app on a Kubernetes cluster running on GKE.
  - Technologies used: **NodeJS**, **jQuery** and **Google Firebase**.
- Developed AI based presentation control system
  - **Won 1st place** at the NC State University PackHacks 2019 Hackathon.
  - System listens to the speaker and automatically progresses the slides.
  - Allows speakers to focus on the delivery while the AI handles the visuals.
- Developed a combat fun game that can be played by hands instead of keyboard strokes
  - **Won 1st place** (Best Game) at the HackNC 2019 Hackathon.
  - Developed using **Unity**, **C#**, and the **Leap Motion Controller**.
- Built an online peer / AI tutoring service
  - **Won 2nd place** (College Track) at the PackHacks 2021 Hackathon.
  - Users can interact live with tutors or an AI powered by WolframAlpha.
  - Developed using **NodeJS**, **Python**, **jQuery**, and **Google Firebase**.
- Developed a website for showcasing movies and shows using the Red Ventures API
  - **Won 3rd place** (Tech and Overall) at the Red Ventures Case Competition 2019.
  - Leveraged REST APIs from the Red Venture digital platform.
- Built a new game engine from scratch using **Java**
  - Engine capability includes tasks such as map creation, particle systems, AI control, and player movement/control.
  - Served as base engine for several additional games I developed.
- Developed several websites including personal portfolio and awarding winning site for competitions (aszala.com/tsa - 1st and 3rd place on state level for webdesign).