2508 Dianes Way,
Warrington, PA 18976

Aashish Cheruvu

Email: aashcheruvu@gmail.com
Mobile: +1 215-500-5766
www.aashishcheruvu.com

Education

Central Bucks High School South — Warrington, PA
GPA: 4.60/4.0; Rank: 1/577 (Current Valedictorian) — *August 2021 - June 2024*

Coca Cola Scholar: *Semi-Finalist;* ***National Merit Scholar:*** *Semi-Finalist;* ***Duke TIP Scholar of Distinction***

Harvard Extension School (Undergraduate Credit Courses): *Introduction to Statistical Modeling, Web Applications for Data Science, Computer Vision and Wearable Devices*

Test Scores: *AMC 12 (Top 10%): 91.5; SAT: 1570/1600; ACT: 36/36; 5 out of 5 in 8 AP tests*

Experience

Perelman School of Medicine,University of Pennsylvania, *Research Associate* — *August 2023 - Present*

- Application of deep learning based head and neck cancer progression modeling with longitudinal PET-MRI data. (Prof.Abbas Alavi, MD., PhD)

Pennsylvania State University, *Research Intern* — *June 2023 - Present*

- Application of deep learning-based multimodal Neural Architecture Search Models with EHR data (Fenglong Ma, PhD)

Pennsylvania Biotechnology Center (Selective Program), *Research Internship* — *August 2022 - Present*

- Identify RNA biomarkers using machine learning approaches; In-lab validation of the biomarkers using molecular biology techniques (Aejaz Sayeed, PhD)

Lockheed Martin (Selective Paid Internship), *Machine Learning Engineering Intern* — *June 2022 - Present*

- Developing large language models and prompt engineering for firefighting intelligence (Nathaniel Rigoni)
- Support the CodeQuest Academy as a High School Liaison by working with schools internationally, including my school and in the UK in organizing coding classes and competitions.

Food and Drug Administration, *Research Intern* — *June 2022 - August 2022*

- Application of deep learning-based time series modeling using multimodal data in disease progression (Hao Zhu, PhD)

Yale School of Medicine, *Incoming Summer Intern, Julius Chapiro Lab, MD/PhD* — *June 2024*

Publications

- Aashish Cheruvu, "Multimodal Recommender System in the Prediction of Disease Comorbidity," 2022 Fourth International Conference on Transdisciplinary AI (TransAI), 2022, pp. 79-82, doi: 10.1109/TransAI54797.2022.00020
- Aashish Cheruvu, "Application of Neural-Controlled Differential Equations in Disease Progression Modeling Using Irregularly Sampled Multimodal Data," 2023 Fifth International Conference on Transdisciplinary AI (TransAI), 2023.
- Aashish Cheruvu, "Bagged Fuzzy-Rough Nearest Neighbors (BFRNNs): A Novel Ensemble Learning Algorithm for Disease Diagnosis and Prognosis Prediction," medRxiv 2023.10.21.23297353; doi: https://doi.org/10.1101/2023.10.21.23297353
- Aashish Cheruvu, Daniel Zezulinski, Aejaz Sayeed, "Application of Attention and Graph Transformer-Based Approaches for RNA Biomarker Discovery in Metabolically-Associated Fatty Liver Disease (MAFL/NASH)" bioRxiv 2023.11.05.565710; doi: https://doi.org/10.1101/2023.11.05.565710
- Aashish Cheruvu, Nathaniel Rigoni " ILDNet: A Neural Differential-Equation Based Disease Progression Model for Pulmonary Fibrosis," 2024 Society for Industrial and Applied Mathematics International Conference on Data Mining (SDM24), Houston, TX, US. (Under Review)

Presentations

- Invited presentation to ORISE fellows on "Multimodal Recommender System in the Prediction of Disease Comorbidity", Department of Pharmacometrics, Center for Drug Evaluate and Research, Food and Drug Administration (FDA), 2022.
- Presented at 2022 Fourth International Conference on Transdisciplinary AI (TransAI) on Multimodal Recommender System in the Prediction of Disease Comorbidity
- Presented at 2023 Fifth International Conference on Transdisciplinary AI (TransAI) on Neural-Controlled Differential Equations in Disease Progression Modeling Using Irregularly Sampled Multimodal Data

Honors and Awards

2023: Coca-Cola Scholarship – Semifinalist; PennFTC State Championship Finalist; Qualified for AIME; HOSA State Leadership Conference- Health Informatics- First Place; Future Business Leaders of America (FBLA) State Database and Design – Top 5 in Nationals

2022: PennFTC State Championship Finalist; Pennsylvania State University Eberly College of Science Scholarship Recipient; Pennsylvania State University College of Engineering Scholarship Recipien; 1st Place Award with Perfect Score: Pennsylvania Junior Academy of Science State Competition, PennFTC Regional Think Award 1st Place; Lockheed Martin CodeQuest Senior Division – 1st Place; Future Business Leaders of America (FBLA) Regional Database and Design – 1st PlacePenn; FTC Regional Think Award Winner

2021: HOSA International Leadership Conference- Health Informatics-Silver Medalist; Bucks County Research Science Competition Computer Science Category- First Place; Delaware Valley Science Fairs – 3rd Place; Office of Naval Research- Naval Science Award; FTC Regional Think Award Winner;Lockheed Martin CodeQuest Senior Division-1st Place

2020: Delaware Valley Science Fairs (Gold Medal); BROADCOMM Masters Entrant; Bucks County Research Science Competition (Mathematics Category) - CBCares Educational Foundation Research Award;You Bethe Chemist Competition National Competition Entrant (Final discontinued due to COVID) 2019: Scholars of Distinction- Duke University Talent Identification Program

Community Service

Telugu Association of Greater Delaware Valley Youth Committee, *Co-Chair* September 2019 - Present

- Proceedings from the volunteer activities totalling $25,000 was donated to local charities

People for Urban and Rural Education (PURE), *Director and Ambassador* *September 2019 - Present*

- Proceedings from the volunteer activities totalling $15,000 was donated to local charities

North American Telugu Society, *Philadelphia Youth President* *September 2019 - Present*
Payless Health, *Volunteer* *September 2023 - Present*

Leadership and Experience

Artificial Intelligence and Data Science Club, *Founder President* *June 2021 - Present*

- Founded a data science and AI club with over 30 members, focusing on its application in various careers. Hosted events featuring speakers from Harvard and Lockheed Martin, and organized interactive code-along AI sessions and group projects.

Biotechnology Partnership Program Leadership Council *August 2022 - Present*

- Highly selective high school research program in partnership with the Pennsylvania Biotechnology Center, a biotechnology incubator. Helped the teacher in planning the year and program activities, hosted sessions to answer science research questions.

STEM Research Club Leadership Council, *Founder President* *June 2020 - Present*

- Took the initiative to restart the STEM Research Club at my school. Involved in the conceptualizing, planning, and executing of 30 science fair projects

  guiding students in

HOSA (Future Health Professionals) Club Leadership Council *August 2021 - Present*

- Leadership council member of one of my high school's largest clubs with around 120 members. Organized fundraiser events, arranged shadowing opportunities, medical escape rooms, and Kahoot competitions. Organized for members to attend the state competition in-person for the first time since COVID.

FBLA (Future Business Leaders of America) Club Leadership Council *August 2022-present*

- As a leadership council member of FBLA at my high school, assisted in competition registration and student preparation, contributing to our school sending five students to the National Leadership Conference—a first for the school district. My outreach efforts significantly grew the club from 30 to over 100 members this year.

FIRST Tech Challenge Team 16606 Tech-Knight Robotics *June 2021-2023*

- As the lead programmer, developed state-of-the-art YOLO models for real-time AI-based object detection and created autonomous robot motion planning algorithms. Engaged in community outreach by demonstrating our robot to spark interest in technology. My efforts include teaching robotics and Java coding to local students, supporting our mission to enhance STEM awareness among youth.

Student Council Co-President *2019-2020*

- In the Student Council, played a key role in sustaining school spirit and engagement during COVID-19, organizing various events in virtual and hybrid formats for inclusivity. My efforts included virtual spirit days and interactive trivia, all to maintain a connected and involved student community amidst physical distancing challenges.

Programming Skills

Python • R • SQL • Machine Learning • Deep Learning • Natural Language Processing • Computer Vision • rust •Java • unix • vim • Google Cloud

Projects

Deep Learning-based RNA Biomarker Discovery Using Transformer Models and Explainable AI (2023)

- Developed and evaluated multiple attention-based models and graph neural network-based models (graph attention networks, GATs; graph transformers) to identify biomarkers for early-stage liver diseases (non-alcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH)) using explainable AI. In-lab validation of identified was evaluated using reverse-transcription-quantitative polymerase chain reaction (RT-qPCR)

A Novel Application of Neural Controlled Differential Equations in Disease Progression Modeling Using Multimodal Deep Learning (2022)

- Developed and evaluated multiple time series models (LSTM, Sequence-to-Sequence, and Neural Controlled Differential Equations) in combination with image models (EfficientNet) in predicting Alzheimer's and Pulmonary Fibrosis progression using both structured and image data.

A Novel Application of Deep Learning Recommender Systems in Disease Diagnosis (2021)

- Developed and evaluated an implicit feedback-based hybrid content/collaborative filtering model in disease prognosis. Text features were extracted from clinical notes using SciSpacy, and feature combination was used as the hybridization technique.

Using Medical Transcriptions to Accurately Predict Medical Specialties with tidymodels (2021)

- Extracted important text features from medical transcription text and used the tidymodels packages to train and evaluate the performance of various standard machine learning models in predicting medical specialty.

Use of Machine Learning Approaches in Predicting Chemical Reaction Rates of Compounds with OH and HO2 in the Atmosphere (2020-2021)

- Extracted physico-chemical features of compounds and applied various machine learning techniques with the goal of predicting reaction rates of compounds with OH and HO2 in the atmosphere.

A Novel Machine Learning Algorithm in Disease Diagnosis and Prognosis (2020)

- Created a novel machine learning algorithm, Bagged Fuzzy Rough Nearest Neighbors that is an ensemble of the Fuzzy Rough Nearest Neighbors and uses a Borda count based voting metric. The algorithm was tested on the Wisconsin Breast Cancer Dataset and was evaluated alongside other baseline machine learning algorithms.