Dr. Sai Deepthi Yeddula

syeddula@oakland.edu | +1 (248) 370-4087 | LinkedIn | Github | Website

Education

Ph.D. Computer Science and Software Engineering - Auburn University, AL, USA ***2018 - 2024***

Dissertation Topic: Development of Advanced Deep Learning Solutions for Domain-Specific Challenges
GPA: 3.88/4.0

M.S. Computer Science and Software Engineering - Auburn University, AL, USA ***2018 - 2021***

GPA: 4.0/4.0

B.Tech. Computer Science Engineering - Sri Venkateswara University, AP, India ***2012 - 2016***

Percentage: 83.7/100

Technical Skills

Areas of Interest: Data Science, Machine Learning, Deep Learning, Data Mining

Languages: C/C++, C#, HTML, Java, JavaScript, NodeJS, Typescript, Python, R, SAS

Databases: SQL Server, MySQL, OracleDB2, PostgreSQL

Libraries and Tools: TensorFlow, PyTorch, Google Colab, Github, MATLAB, Tableau, Flask, Docker, Azure

Teaching Experience

Tenure-Track Assistant Professor – Oakland University, MI, USA ***September 2024 - Present***
CSI 2300 – Department of Computer Science and Engineering

- Teaching object-oriented computing concepts in Java programming language to over a class of 25 students, designing comprehensive projects and assignments, and structuring a dynamic course curriculum that fosters hands-on learning and deep conceptual understanding.

Graduate Teaching Assistant - Auburn University, AL, USA ***2018 – 2021, May 2023 – August 2024***
COMP 1210, CPSC 1210, CPSC 1220 - Department of Computer Science and Software Engineering

- Guided students in developing their hands-on programming skills and proficiency, enhancing their practical understanding of fundamentals of Java programming concepts.
- Monitored exams and grades assignments in accordance with the university's standards, ensuring fairness and consistency in evaluation processes.
- Demonstrated professionalism in written and oral communication, fostering a positive and conducive learning environment for all students.

Graduate Teaching Associate - Auburn University, AL, USA ***2022 – May 2023***
COMP 1210 - Department of Computer Science and Software Engineering

- Delivered engaging classroom instruction on Java Programming Language to 100+ undergraduate students, significantly enhancing their coding skills and understanding of key concepts.

- Prepared comprehensive exam material and led a team of 7+ teaching assistants in monitoring hands-on labs for 200+ students, showcasing strong leadership, decision-making, and management skills.
- Managed Canvas courses for multiple classes efficiently, ensuring a seamless and interactive learning experience for students by regularly assisting in course content and facilitating online discussions.

Graduate Teaching Assistant - Auburn University, AL, USA ***Summer 2021***
CPSC 5200 - Department of Computer Science and Software Engineering

- Graded assignments and provided hands-on assistance to students on projects involving XML, event-driven programming, and the integration of Communication and Web Services with XML, enhancing their proficiency in modern web technologies including JQuery, XHTML, and HTML5.
- Facilitated student understanding and application of XML and database integration, offering guidance on implementing dynamic web applications.

Research Experience

Computer Science and Software Engineering, Auburn University, AL, USA

Real-Time Traffic Safety Enhancement for Personalized Accident Risk Assessment ***2024***
- Expanding the traffic safety deep learning framework by incorporating live data feeds, including Global Positioning System (GPS) tracking, traffic updates, and social media insights.
- Developing user-specific safety alerts based on location and movement and testing the model's adaptability in various urban settings.

Data-Driven Road Safety: TCN for Accurate Traffic Accidents Hotspot Classification ***2023***
- Conducted quantitative analysis over 0.3 million U.S. traffic accident records from 2016-2021 following the acquisition of the real-world National Highway Traffic Safety Administration (NHTSA) dataset, identifying 35+ key factors contributing to accident trends missed in 80% of previous studies.
- Implemented a Temporal Convolutional Network (TCN) to comprehend intricate spatio-temporal relationships in accident data and enhanced hotspot prediction accuracy by 2% over state-of-the-art methods aiding transportation officials in proactive accident mitigation.

Iterative Gradient Rank Pruning Algorithm for Finding Faster Trainable Graph Neural Networks ***2022***
- Assisted in developing a novel unstructured graph pruning algorithm for finding Faster Trainable Graph Neural Networks on large-scale graph datasets resulting in an iterative gradient rank technique innovation. We employed Graphic Processing Units (GPUs) acceleration using CUDA kernel and parameter tuning for performance modelling without compromising the accuracy benchmark.
- Resolved layer collapse problem and achieved maximal critical compression while reducing computational costs and storage requirements.

Leaf Area Index Prediction Using Temporal Deep Learning Models ***2022***
- Advanced the understanding of vegetation structure's influence on global climate change by improving leaf area index prediction accuracy to 84%, a pivotal improvement in ecological research.
- Adapted deep learning algorithms, Convolutional and Long Short Term Memory Neural Networks to learn temporal features of various landcover types collected on cloud over a period of 34 years.

Predicting Crop Yields in the United States by Integrating Deep Learning with GIS ***2021***
- Involved in collaboration with Geospatial Systems teams, resulting in the development of a data-driven approach through a deep learning framework that integrates Computer Vision with Geo-spatial Artificial Intelligence (GeoAI).

- Preprocessed and trained the proposed model using 16+ years of remote sensing data, covering over 800 major crop production counties. This framework achieved a 92% accuracy rate in predicting yields for various crop types using Gaussian Process, surpassing Machine Learning models (ML models) by 10%.

Industrial Experience

System Developer Intern - Stratice LLC, Montgomery, AL, USA ***Summer 2019***

- Created a strategic website UI design tailored to customer needs, backed by written use cases which boosted customer engagement by 60%, aligning seamlessly with company objectives and fortifying market strategy.
- Developed an interactive website that enhanced brand awareness with a 50% growth in web traffic metrics and 2x the average page views resolving prior interface issues within 3 months.
- Engaged in daily status meetings, ensuring cross-functional collaborations in a rapid prototyping environment demonstrating strong problem solving and communication skills achieving a 95% on-time project delivery rate and steadfast adherence to milestones.

System Engineer - Infosys Limited, Mysore, India ***2016 - 2018***

- Engineered and launched 5+ web applications in ASP.NET and MVC using C# within two years, leveraging agile methodologies and Scrum management, resulting in a 25% increase in user engagement.
- Upgraded and migrated 100+ DTS packages to SQL Server Integration Services (SSIS) successfully, enhancing the data warehousing capability by 50% and streamlining ETL (Extract, Transform, Load) pipelines.
- Implemented the Software Development Life Cycle (SDLC) framework across 7 projects, ensuring a 98% adherence to coding standards and a 30% faster turnaround in unit testing and debugging plans.

Publications

- Chen Jiang, **Sai Deepthi Yeddula**, Wei-Shinn Ku, A Convolutional Neural Network Model for Accurate Short-Term Leaf Area Index Prediction, **Springer Nature Journal of Modeling Earth Systems and Environment** , 2024.
- **Sai Deepthi Yeddula**, Development of Advanced Deep Learning Algorithms for Domain-Specific Challenges, **Auburn University Electronic Thesis and Dissertation**, 2024.
- Po-Wei Harn, Bo Hui, **Sai Deepthi Yeddula**, Libo Sun, Min-Te Sun, Wei-Shinn Ku, An Advanced Quadtree Based Genetic Programming Search on Searchable Encryption Optimization**, In the Journal of IEEE Transactions on Evolutionary Computation** (Under Review), 2024.
- **Sai Deepthi Yeddula**, Chen Jiang, Bo Hui, Wei-Shinn Ku, *Traffic Accident Hotspot Prediction Using Temporal Convolutional Networks: A Spatio-Temporal Approach*, In 31st ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, **ACM SIGSPATIAL**, 2023.
- Po-Wei Harn; **Sai Deepthi Yeddula**; Bo Hui; Jie Zhang; Libo Sun; Min-Te Sun; Wei-Shinn Ku, *IGRP: Iterative Gradient Rank Pruning for Finding Graph Lottery Ticket,* In 2022 IEEE International Conference on Big Data (Big Data), pp. 931-941. **IEEE**, 2022.
- Po-Wei Harn; **Sai Deepthi Yeddula**; Libo Sun; Min-Te Sun; Wei-Shinn Ku, *Location-based Alert System Using Searchable Encryption with Hilbert Curve Encoding*, In 2022 IEEE International Conference on Big Data (Big Data), pp. 1445-1454. **IEEE**, 2022.
- Po-Wei Harn; Bo Hui; **Sai Deepthi Yeddula**; Libo Sun; Min-Te Sun; Wei-Shinn Ku, *A Novel Quadtree-Based Genetic Programming Search for Searchable Encryption Optimization*, In Proceedings of the Companion Conference on Genetic and Evolutionary Computation, pp. 583-586. **GECCO**, 2023.

- Naiqing Pan, Chen Jiang, **Sai Deepthi Yeddula**, Shufen Pan, Wei-Shinn Ku, Hanqin Tian, *Applying deep neural networks and remote sensing to predict yields of major crops in the United States*, **AGU Fall Meeting**, 2021.

Selected Presentations

- **Sai Deepthi Yeddula**, Chen Jiang, Bo Hui, Wei-Shinn Ku, *Traffic Accident Hotspot Prediction Using Temporal Convolutional Networks: A Spatio-Temporal Approach*, ACM SIGSPATIAL 2023.
- **Sai Deepthi Yeddula**, Chen Jiang, Bo Hui, Wei-Shinn Ku, *Data-Driven Road Safety: How Temporal Convolutional Networks (TCNs) Transcends Traditional Models for Accurate Traffic Accidents Hotspot Prediction*, Auburn Graduate Engineering Research Poster and Oral Competition 2023.
- **Sai Deepthi Yeddula**, Chen Jiang, Bo Hui, Wei-Shinn Ku, *A New Lens on Road Safety: Using Deep Learning to Predict Accident-Prone Zones*, Auburn Three Minute Thesis Competition 2023.
- **Sai Deepthi Yeddula**, Po-wei Harn, Bo Hui, Wei-Shinn Ku, *A Heuristic-DBSCAN Algorithm for an Efficient Geospatial Clustering Analysis in Network Space*, Auburn Graduate Engineering Research Showcase 2022.
- Naiqing Pan, Chen Jiang, **Sai Deepthi Yeddula**, Shufen pan, Wei-Shinn Ku, Hanqin Tian, *Predicting Crop Yields in the United States by Integrating Deep Learning with Ground and Satellite Observations*, Auburn Research Symposium 2021.
- **Sai Deepthi Yeddula**, Wei-Shinn Ku*, Data Science in Healthcare - Disease Prediction based on patient's 24-hour ICU data*, Women In Data Science Datathon 2021.

Reviewer Experience

External Reviewer for 40th IEEE International Conference on Data Engineering ***2024***
IEEE ICDE

External Reviewer for 23rd and 24th IEEE International Conference on Data Mining ***2023, 2024***
IEEE ICDM

Certifications

Verma Graduate Student Leadership Workshop ***2024***
- Auburn University

Natural Language Processing in Microsoft Azure Certificate ***2024***
- Microsoft Azure AI

Generative Artificial Intelligence (Gen AI) Certificate ***2024***
- Google Cloud Training

NVIDIA DLI Certificate – Fundamentals of Accelerated Data Science with RAPIDS ***2022***
- NVIDIA Deep Learning Institute

Business Analytics Graduate Certificate ***2020***
- Auburn University Harbert College of Business

Awards and Honors

Outstanding Graduate Student Council Senator Award ***2019***
Auburn University Graduate School, AL, USA

- Awarded for the excellent service provided at Auburn University's Graduate School Council.

Bogineni Chenchu Rama Naidu Gold Medal ***2017***
Sri Venkateswara University, AP, India
- Awarded for the exceptional academic performance in undergraduate studies

Pathipati Prameela Devi Memorial Award ***2016***
Sri Venkateswara University, AP, India
- Honored as the outstanding Departmental Student for achieving top grades in undergraduate studies

Volunteer and Leadership Experience

Shark Tank Activity Judge ***2024***
Council of Engineering Graduate Students at Auburn University
- Served as a judge for a university-hosted, Shark Tank-inspired competition, evaluating the engineering design processes and innovative pitches of 10 student groups promoting the practical application of engineering principles and entrepreneurial development.

Junior Division Judge in Robotic Systems and Communication Technology ***2023***
Alabama Science and Engineering Fair, Auburn University, AL, USA
- Provided constructive feedback for 10+ Robotics and Communication Technology projects by actively encouraging and inspiring young students to pursue their interests in science and research.

Annual E-day Open House Volunteer ***2019, 2023***
Society of Women Engineers, Auburn University, AL, USA
- Accompanied high school students in visiting Auburn University campus and encouraging their interests in higher education and career orientation provided through Engineering Services.

First Year Experience Program Mentor ***2019 – 2020***
Auburn University Graduate School, AL, USA
- Mentored newly joined Auburn computer science graduate students guiding them in the course curriculum and helping them walk through the opportunities ensuring their smooth transition.

Graduate Student Council Senator ***2018 - 2020***
Auburn University Graduate School, AL, USA
- Participated in committee discussions to make a motion to institute new policies and assisted in organizing and executing educational and social events for graduate school council.

Organizations

Association for Computing Machinery for Women in Computing (ACM-W) ***2023 - Present***
Professional Member - ACM

Society of Women Engineers ***2023 - Present***
Member - Auburn University Samuel Ginn College of Engineering, AL, USA

Data Science Society ***2020 – Present***
Member - Auburn University, AL, USA

Auburn Association for Computing Machinery (ACM) ***2020 – Present***
Member - Auburn University Samuel Ginn College of Engineering, AL, USA

100+ Women Strong ***2020 – 2021***
Mentee - Auburn University, AL, USA

Graduate Student Council ***2018 – 2020***
Senator, First Year Experience Program Mentor - Auburn University, AL, USA