

Curriculum Vitae

Abinava Yeshwanth Kalayambakam Janardhan (KJ)

Graduate Research Assistant
Biosystems and Agricultural Engineering
Oklahoma State University
391 Agricultural Hall, Stillwater, OK 74078
Email: akalaya@okstate.edu
LinkedIn: [LinkedIn Profile](#)

Education

PhD in Biosystems and Agricultural Engineering Oklahoma State University, Stillwater, OK	Jan 2026 – May 2029
Master of Science in Computer Science Oklahoma State University, Stillwater, OK	Aug 2023 – Dec 2025
Bachelor of Technology in Computer Science Sree Vidyanikethan Engineering College, Tirupati, AP	Aug 2019 – May 2023

Professional Experience

Graduate Research Assistant, Biosystems and Agricultural Engineering May 2024 – Present
Oklahoma State University, Stillwater, OK

Projects**Oklahoma Agricultural Scientific Irrigation Scheduler (OASIS)**

- Currently developing the OASIS tool, a full-stack application focused on data processing and handling large datasets to provide optimized irrigation recommendations for farmers.
- Automated both soil and weather data extraction, utilizing the Rosetta model for soil property estimation and integrating real-time weather data for accurate forecasting.
- Used React JS for the frontend, Fast API with Axios for the backend, and incorporating dynamic graphs via plotly to offer real-time visualizations for farmers.
- Implementing REST and SOAP APIs to retrieve data from external websites, ensuring smooth integration of weather, soil, and other relevant data sources for actionable insights.
- Used Docker to containerize the application and DASNR IT virtual machine for hosting this tool online.
- Used AWS SES services for sending email notifications to users.

Multi Depth Soil Moisture Prediction Using Machine Learning

- Built and compared five machine learning models LSTM, XGBoost, Random Forest, Transformer, and LightGBM for multi-depth soil moisture prediction, analyzing results and iteratively improving model performance.

- Engineered lag-based temporal features (up to 3 lags) to capture soil water memory dynamics, enabling fully autoregressive predictions without relying on in-situ sensor inputs.
- Developing model to a scalable soil moisture prediction model across diverse agricultural regions in Oklahoma, supporting data-driven irrigation scheduling.

NOAA NDFD Forecast Data Processing and Aggregation Pipeline

- Processed high-frequency GRIB2 weather forecast files from NOAA's NDFD S3 bucket, converting multi-day UTC-based data into daily CSVs aligned with Central Time (CST) for agricultural use cases.
- Engineered robust Python pipelines to extract, aggregate, and transform 7-day forecasts for variables such as TMAX, TMIN, RHMAX, RHMIN, QPF, dew point, wind speed, and sky cover across Mesonet stations.
- Implemented accurate UTC to CST conversion logic for valid Time fields, ensuring precise temporal alignment of forecasts with end-user regional time zones and daily agronomic models.
- Automated spatial merging with station-specific elevation and latitude to compute solar radiation (SRAD) from sky cover data using FAO radiation equations.

Student Assistant, Computer Science and Engineering

Jan 2022 – Nov 2022

Sree Vidyanikethan Engineering College, Tirupati, AP

Projects

Natural Disaster Prediction

- Developed a web-based natural disaster prediction tool using HTML5, Javascript frameworks, and integrated machine learning models using flask APIs.
- Processed data through random forest machine learning algorithm for predictive analytics.
- Created a user-friendly interface employing responsive design and Javascript libraries for dynamic data visualization.

Software Developer Intern

Nov 2022 – Jul 2023

Federal Soft Systems, Tirupati, AP

Projects

Media Sentiment Analysis for Marketing Insights

- Worked on Media Sentiment Analysis for marketing insights, focusing on gathering and analyzing social media data to derive insights for marketing strategies.
- Designed and implemented a robust data pipeline using python, R, and SQL to collect, clean, and analyze social media data from Twitter and Facebook APIs.
- Processed over 100,000 data points using tools like Jupyter Notebook, pandas, and scikit-learn, applying machine learning models for sentiment classification.
- Created visualizations with matplotlib to uncover sentiment trends and popular topics, enabling data-driven marketing strategies.

Field Work Experience

- Central Oklahoma- Soil moisture sensors (Sentek Drill and Drop) and rain gauge.
- Oklahoma Panhandle- Assisted in installing Soil moisture sensors and rain gauges in 15 producer's fields in 2025 and 2026. (USDA Funded Project)
- Assisted in installation of Eddy Covariance Flux Tower at Oklahoma Panhandle Research and Extension Centre with Li-cor team.
- Assisted in IRT canopy temperature sensors installation and Acclima soil moisture sensors in Southwest Oklahoma Research Extension Station.
- Data collection from ZL6 data loggers on a bi-weekly basis from different regions in Oklahoma.

Skills

Python, C++, SQL, SQLite, Java, Pandas, TensorFlow, pyTorch, Scikit, Fast API, Swift, Flask, Rest APIs, HTML, CSS, Javascript, Php, Docker, Linux, Machine Learning, Transformers, React.js, Angular, OpenCV, AWS services, High-performance supercomputing, Batch processing and parallel processing, ArcGIS, Google Earth Engine (GEE), Git, Microsoft Office, Data Visualizations, Generative AI, NumPy.

Research Papers & Publications

1. **Kalayambakam Janardhan, A. Y.**, Datta, S., Taghvaeian, S., Crick, C., & Palash Kumar, K. (2026). [Poster] Data-Driven Modeling of Soil Moisture in Irrigated Fields. 19th IEEE Dallas Circuits and Systems Conference, Dallas, TX, April 10–12, 2026. DOI: [10.1109/DCAS69364.2026.11544580](https://doi.org/10.1109/DCAS69364.2026.11544580)
2. Meadi, S., **Kalayambakam Janardhan, A. Y.**, Datta, S., & Das, H. (2026). Canopy Temperature Sensor Data Optimization for Irrigation Scheduling. 2026 IEEE DCAS Conference, Dallas, TX, April 10–12, 2026. DOI: [10.1109/DCAS69364.2026.11545108](https://doi.org/10.1109/DCAS69364.2026.11545108)
3. Ganesh, D., **Abinava Yeshwanth, K. J.**, Meadi, S., Guru Sai Vignesh Reddy, M., Chirudeep, T., & Naveen Kumar Polisetty, S. (2022). Extreme Learning Mechanism for Classification & Prediction of Soil Fertility Index. Journal of Pharmaceutical Negative Results, 13 (Special Issue 06), 37–43. DOI: [10.47750/pnr.2022.13.S06.006](https://doi.org/10.47750/pnr.2022.13.S06.006)

Conference Presentations

1. **Kalayambakam Janardhan, A. Y.**, Datta, S., Taghvaeian, S., Crick, C., & Palash Kumar, K. (2026). [Oral] Data-Driven Modeling of Multi-Depth Soil Moisture in Irrigated Fields. American Society of Agricultural and Biological Engineers 119th Annual International Meeting, Indianapolis, IN, July12-15.
2. Meadi, S., **Kalayambakam Janardhan, A. Y.**, & Datta, S. (2026). [Oral] Can We Accurately Estimate Canopy Temperature Without Adjusting Sensor Heights to Reduce Labor Requirements? American Society of Agricultural and Biological Engineers 119th Annual International Meeting, Indianapolis, IN, July12-15.

3. Datta, S., Meadi, S., & **Kalayambakam Janardhan, A. Y.** (2026) [Oral] Paving the Path Forward to a National Scale Irrigation Scheduler by Leveraging Pyfao56. American Society of Agricultural and Biological Engineers 119th Annual International Meeting, Indianapolis, IN, July 12-15.
4. **Kalayambakam Janardhan, A. Y.**, Datta, S., Taghvaeian, S., Crick, C., & Palash Kumar, K. (2026). [Poster] Data-Driven Modeling of Soil Moisture in Irrigated Fields. 19th IEEE Dallas Circuits and Systems Conference, Dallas, TX, April 10-12, 2026.
5. Meadi, S., **Kalayambakam Janardhan, A. Y.**, Datta, S., & Das, H. (2026). [Oral] Canopy Temperature Sensor Data Optimization for Irrigation Scheduling. 19th IEEE Dallas Circuits and Systems Conference, Dallas, TX, April 10-12, 2026.
6. **Kalayambakam Janardhan, A. Y.**, Datta, S., Taghvaeian, S., Crick, C., & Palash Kumar, K. (2025). [Oral] Data-Driven Modeling of Soil Moisture for Irrigation Scheduling. 2025 Oklahoma Governor's Water Conference & Research Symposium, Midwest City, OK, December 3-4, 2025.
7. **Kalayambakam Janardhan, A. Y.**, & Datta, S. (2025). [3-Minute Presentation] Oklahoma Irrigation Scheduler: Paving the Path for Sustainable Water Management. 2025 ASABE Oklahoma Sectional Meeting, Stillwater, OK, March 7, 2025.
8. **Kalayambakam Janardhan, A. Y.**, & Datta, S. (2024). [Poster] Oklahoma Agricultural Scientific Irrigation Scheduler. 2024 Oklahoma Governor's Water Conference & Research Symposium, Midwest City, OK, November 19-20, 2024.

Professional Membership

- American Society of Agricultural & Biological Engineers (ASABE):
- Institute of Electrical and Electronics Engineers (IEEE):

Training and Accomplishments

- Passed the Fundamentals of Engineering (FE) exam on the first attempt at the Stillwater testing center.
- Participated in the Master Irrigator Program and gathered valuable feedback from growers to improve usability and impact of Oklahoma Agricultural Scientific Irrigation Scheduler tool.
- Interview panel member:
 - I participated as a panel member in interviews for students shortlisted for interviews to the PhD program in Biosystems and Agricultural Engineering at Oklahoma State University. (Dr. Sumon Datta's Irrigation Research Laboratory).
 - Assigned task for the selected members to further evaluate them on their conceptual skills and written skills.

Resume

EDUCATION

PhD in Biosystems and Agricultural Engineering Oklahoma State University, Stillwater, OK	Expected May 2029
Master of Science in Computer Science Oklahoma State University, Stillwater, OK	Dec 2025
Bachelor of Technology in Computer Science Sree Vidyanikethan Engineering College, Tirupati, AP	May 2023

TECHNICAL SKILLS

Languages: Python, SQL, C++, Java, JavaScript, HTML, CSS

Data & ML: Pandas, NumPy, scikit-learn, TensorFlow, PyTorch, Plotly

Development: React.js, FastAPI, Flask, REST/SOAP APIs, Docker, Git, Linux, AWS SES

PROFESSIONAL EXPERIENCE

Graduate Research Assistant Oklahoma State University, Biosystems and Agricultural Engineering, Stillwater, OK	May 2024 - Present
• Develop OASIS, a full-stack irrigation scheduling tool, using React.js, FastAPI, and Plotly to process soil and weather data and provide recommendations for farmers. • Automated soil and weather data extraction, integrated the Rosetta model for soil property estimation, and containerized the application with Docker for virtual-machine hosting. • Built and compared five soil moisture prediction models: LSTM, XGBoost, Random Forest, Transformer, and LightGBM; engineered temporal features with up to three lags. • Engineered Python pipelines to transform NOAA NDFD GRIB2 data into daily CSVs for seven-day forecasts, aligning time zones and aggregating variables across Mesonet stations.	
Software Developer Intern Federal Soft Systems, Tirupati, AP	Nov 2022 - Jul 2023
• Designed a Python, R, and SQL pipeline to collect, clean, and analyze Twitter and Facebook data for media sentiment analysis and marketing insights. • Processed over 100,000 data points with Pandas and scikit-learn for sentiment classification; created Matplotlib visualizations to identify sentiment trends and popular topics.	
Student Assistant, Computer Science and Engineering Sree Vidyanikethan Engineering College, Tirupati, AP	Jan 2022 - Nov 2022
• Developed a web-based natural disaster prediction tool using HTML5, JavaScript, Flask APIs, and Random Forest, with a responsive interface and dynamic visualizations.	

ACHIEVEMENTS & LEADERSHIP

- Passed the Fundamentals of Engineering (FE) exam on the first attempt at the Stillwater testing center.
- Served on a PhD admissions interview panel and assigned tasks to evaluate applicants' conceptual and written skills at Oklahoma State University.