KESHAWA DADALLAGE

linkedin/in/keshawa dadallage | github.com/keshawa-dadallage | keshawa.dadallage@wsu.edu | +15092969798

EDUCATION

- Ph.D. Candidate, Biological Systems Engineering | Washington State University - Jan 2023 to Present | USA
- BSc (Hons), Electrical and Information Engineering | University of Ruhuna - Grad. Nov 2017 | Sri Lanka
- Diploma in Hardware Engineering | BCCA Computer Academy - Grad. Oct 2011 | Sri Lanka
- Diploma in Mobile Phone Hardware | C&A Electronics - Grad. Nov 2011 | Sri Lanka

PROFESSIONAL EXPERIENCE

- Graduate Research Assistant | Washington State University | 2023 to Present - Pullman, WA
  - Lead innovative research on real-time greenhouse gas (GHG) monitoring and precision dairy farming techniques, emphasizing data-driven solutions.
  - Implement cutting-edge remote sensing technologies and machine learning algorithms for real-time cattle health assessment and stress reduction strategies.
  - Develop user-centric visualization platforms to enable data-driven decision-making for improved cattle management and reduced environmental impacts.
- Project Consultant (External) | Inseed International (PVT) Ltd | 2019 - 2022 - Galle, Sri Lanka
  - External project consultant for industrial automation and embedded systems.
  - Consultancy on IoT projects and firmware development.
  - Compliance report generation for industrial apparatus and systems.
- Project Consultant (External) | Decon Consultants (PVT) Ltd | 2020 - 2022 - Colombo, Sri Lanka
  - Electrical design, troubleshooting, testing, and commissioning works.
  - Generating Inspection condition reports and test reports
- Teaching Assistant | University of Ruhuna | 2020 - 2022 - Galle, Sri Lanka
  - Conducted laboratory sessions and workshops related to control systems, Electronics, electrical, Telecommunication, and embedded systems.
  - Student evaluation and grading.
- Assistant Manager – Technical | Laugfs International (PVT) Ltd | 2019 - 2020 - Colombo, Sri Lanka
  - Designed electrical installations, Generator sizing, LV panels, and layouts.
  - Worked on a research project on monitoring and troubleshooting power generators with a cloud-based system.
  - Project supervision, implementation, and monitoring of project tasks.
- Electrical Engineer | Sintech Engineering (PVT) Ltd | 2018 - 2019 - Colombo, Sri Lanka
  - Electrical design and implementation of lighting, power, earthing, lightning protection, switchboards, and wiring diagrams.
  - Testing and commissioning work of electrical distribution systems, earthing systems, standby generators, and fire detection systems.
  - Performed and prepared project scheduling, cost estimations, method statements, project reports, design drawings, shop drawings, and as-built drawings
- In-plant Trainee - Electronics | Vega Innovations (PVT) Ltd | December 2016 to March 2017 | Colombo, Sri Lanka
  - Developed PCB and firmware to measure SOC of deep-cycle batteries.
  - Worked toward the enhancement of the Battery Management System (BMS) for the R&D department of Vega supercar.
- In-plant Trainee - Automation | MAS Active Linea AITC | January to April 2016| Kurunegala, Sri Lanka
  - Developed a digital iron unit, constructed a robotic arm for fabric handling, and implemented an auto sewing overlock machine, significantly enhancing efficiency in textile manufacturing operations.

FELLOWSHIPS & AWARDS

- Arnie and Marta Kegel Fellowship. College of Agricultural, Human, and Natural Resource Sciences. Washington State University, USA, 2026
- Altium Global Scholarship, Altium LLC, 2026 — Selected globally for merit-based award and professional PCB design training.
- BSE travel award for ASABE 119th Annual International Meeting, Washington State University, USA, 2026

- Research travel grant award for S1069 meeting: Research and Extension for Unmanned Aircraft Systems (UAS) Applications in U.S. Agriculture and Natural Resources, Oklahoma State University, USA, 2024.
- E.W. KARUNARATHNA Award 2017/2018 for Undergraduate projects in Electrical Engineering. (Electronic Medical Records and Tele-Medicine System for Sri Lanka - MEDICUS), Institute of Engineers Sri Lanka (IESL)

GRANTS

- SHERI for Washington Dairy Farms sustainability. WSU Biologically Intensive Agriculture and Organic Farming (BIOAg) Grant ($40,000). PI: Lav Khot and Co-PI: **Dadallage K.M.** and S.M. Smith (5/26-12/27)

INVENTION DISCLOSURES

- **WSU Disclosure-24-00054:** Weathersonde with integrated mobile/web application for real-time mapping of lower atmospheric attributes. Inventors: **Keshawa Dadallage**, Lav Khot, Basavaraj Amogi, Manuel Garcia-Perez, Leslie Edgar
- **WSU Disclosure-26-00011:** Sensor Hub for Environment & Cattle Ruminant Improvement. Inventors: **Keshawa Dadallage**, Lav Khot, Francisco Leal-Yepes, Manuel Garcia-Perez

PEER-REVIEWED PUBLICATIONS

- Madureira Ferreira, **Dadallage, K. M.**, Ward, T., McCray, H., Ye, R., Sun, J., & Leal Yepes, F. A. (2026). A smarter lung ultrasonography solution for lung consolidation classification in dairy calves using a deep learning approach. Journal of Dairy Science. https://doi.org/10.3168/jds.2026-28434
- **Dadallage, K. M.**, Madureira Ferreira, M., Zapata-Salazar, A., Ceballos, D. A., Khot, L. R., & Leal Yepes, F. A. (2025). Development of an Internet of Things–based real-time greenhouse gas and weather monitoring system for precision dairy farming. JDS Communications. https://doi.org/10.3168/jdsc.2025-0862
- **Dadallage, K. M**., Amogi, B. R., Khot, L. R., & Leal Yepes, F. A. (2024). Mask R-CNN and centroid tracking algorithm to process UAV-based thermal-RGB video for drylot cattle heat stress monitoring. Drones, 8(9), 491. https://doi.org/10.3390/drones8090491
- Fernando, P., **Dadallage, K. M.,** Gamage, T., Seneviratne, C., Braeken, A., Madanayake, A., & Liyanage, M. (2023). Distributed-proof-of-sense: Blockchain consensus mechanisms for detecting spectrum access violations of the radio spectrum. IEEE Transactions on Cognitive Communications and Networking, 9(5), 1110–1125. https://doi.org/10.1109/tccn.2023.3291366
- Fernando, P., **Dadallage, K. M.,** Gamage, T., Seneviratne, C., Madanayake, A., & Liyanage, M. (2022). Proof of sense: A novel consensus mechanism for spectrum misuse detection. IEEE Transactions on Industrial Informatics, 18(12), 9206–9216. https://doi.org/10.1109/tii.2022.3169978

TECHNICAL CONFERENCE PRESENTATIONS/ ABSTRACTS

- **Dadallage, K. M.***, Leal Yepes, F. A. and Khot, L. R. (2026). SHERI: Development and Validation of an Active Sampling Sensing System for Greenhouse Gas Quantification in Dairy Cattle. Abstract # 2601593. ASABE 2026 Annual International Meeting, Indianapolis, IN. July 12-14, 2026. (Oral presentation)
- **Dadallage, K. M.***, Brees, A., Thennakoon, N. and Khot, L. R. (2026). Automated Snow Depth Estimation for Agroecological Applications Using Deep Learning on Real-Time Imagery from Open-Field Weather Station Cameras. Abstract # 2601683. ASABE 2026 Annual International Meeting, Indianapolis, IN. July 12-14, 2026. (Oral presentation)
- **Dadallage, K. M.***, Bui, K., Amogi, B. R. and Khot, L. R. (2026). Weathersonde: A UAS-Based Real-Time Spatiotemporal Weather Sensing for Effective Frost Mitigation in Fruit Crops. Abstract # 2601590. ASABE 2026 Annual International Meeting, Indianapolis, IN. July 12-14, 2026. (Poster presentation)
- **Dadallage, K.M.***, Khot, L. R., and Yepes, F. A. L. (2024). Greenhouse gas emission and weather indicators sensing network for improved cattle health. Northwest Bioenergy Summit, Spokane, WA. October 15-16, 2024. (Poster Presentation).

- Dadallage, K.M.*, Khot, L. R., and Yepes, F. A. L. (2024). Comparative analysis of localized vs. mesoscale weather-driven approaches for heat stress monitoring in dairy calves. Abstract # 2401552. ASABE 2024 Annual International Meeting, Anaheim, CA. July 28-31, 2024. (Oral Presentation).
- Dadallage, K.M.*, Khot, L. R., and Yepes, F. A. L., (2024). Greenhouse gas emission and weather indicators sensing network for improved cattle health and climate resiliency of dairy farms. Abstract # 2401553. ASABE 2024 Annual International Meeting, Anaheim, CA. July 28-31, 2024. (Oral Presentation).
- Dadallage, K.M.*, Khot, L. R., and Yepes, F. A. L. (2024). Greenhouse gas emission and weather indicators sensing network for improved cattle health and climate resiliency of dairy farms. CPAAS and Ag Weather Network Open House, IAREC, Prosser, WA. July 12, 2024. (Poster Presentation)
- Dadallage, K.M.*, Khot, L. R., and Yepes, F. A. L. (2024). Smart Farming: Integrated approach for cattle counting, localization, and heat stress estimation in large-scale feedlots. S1069: Research and Extension for Unmanned Aircraft Systems (UAS) Applications in U.S. Agriculture and Natural Resources, Multistate Research Project Meeting, Montana State University, Bozeman, MT. June 13, 2024. (Poster Presentation)
- Dadallage, K.M.*, Khot, L. R., and Yepes, F. A. L. (2024). Greenhouse gas emission and weather indicators sensing network for improved cattle health and climate resiliency of dairy farms. Symposium on Artificial Intelligence in Veterinary Medicine (SAVY), Cornell University, Ithaca, NY. April 19, 2024. (Poster Presentation).

OUTREACH DEMOSTRTIONS/PRESENSTATIONS

- Dadallage, K. M.* and Patel, J. 2026. From Data to Decisions: Exploring Careers in Weather, Data, and Sustainable Agriculture. Washington State 4-H Teen Conference, Pullman, WA, USA. June 23-24, 2026. Participants ~40.
- Dadallage, K. M.* and Patel, J. 2026. AgWeatherNet Smart Farm Demonstration for congressional delegation and industry representatives: Soil–Plant–Weather Sensors and Decision Support for Washington Agriculture. Visit by Congressman Baumgartner and Ag Industry Representatives, Spillman Farm, Pullman, WA, USA. June 16, 2026. Participants ~40.
- Dadallage, K. M.* and Patel, J. 2026. AgWeathernet: Providing a state-of-the-art weather data collection and decision support system for Washington State. Washington Future Farmers of America (FFA) State Convention, Pullman, WA, USA. May 14-15, 2026. Participants ~15
- Dadallage, K. and Khot, L. R.* 2025. Weathersonde: A Drone-Based Sensing for Real-Time Inversion Profiling and Frost Mitigation. 121st Annual Meeting and NW Hort Expo: Washington State Tree Fruit Association (WSTFA), Wenatchee, WA, USA. December 8-10, 2025. Participants ~40. (Outreach presentation and demo)
- Dadallage, K*., 2025. Weathersonde: A Drone-Based Sensing for Real-Time Inversion Profiling and Frost Mitigation. Columbia Club Growers, Kennewick, WA, USA. November 20, 2025. Participants ~40. (Outreach presentation and demo)
- Dadallage, K*., 2025. Thermal-RGB imaging-based fruit surface temperature estimation for apples. Smart Orchard Irrigation and Heat Stress Field Day, Mattawa, WA, USA. July 25, 2025. Participants ~150. (Outreach presentation and demo)
- Dadallage, K*., 2025. Climate-Smart Dairy Farming: Research & Demonstration. Smart Dairy Field Day, Royal Dairy, Royal City, WA, USA. May 30, 2025. Participants ~50. (Outreach presentation and demo)
- Dadallage K.*, Khot, L. R., 2024. Precision Livestock Management: GHG Emissions & Heat Stress Monitoring. CPAAS and Ag Weather Network Open House, IAREC, Prosser, WA. July 12, 2024. Participants: ~60. (Outreach presentation and demo)

PROJECTS

- SHERI – LoRaWAN-Based Greenhouse Gas and Environmental Monitoring Network | 2024–Present

  PrecisionAg Laboratory, Washington State University, USA

  - Led end-to-end development of three generations of IoT-enabled sensing platforms—SHERI v1 (2024), v2 (2025), and v3 (2026)—including custom PCB design, embedded firmware, LoRaWAN communication, solar-powered electronics, and cloud-based data integration.

- Supported deployment of 40+ sensing nodes across commercial and research dairy facilities in Washington and New York, achieving calibration R^2 values of 0.99 (CO_2) and 0.97 (CH_4) for real-time greenhouse gas monitoring.
- Technologies: Embedded Systems, IoT, LoRaWAN, PCB Design, Sensor Calibration, Wireless Sensor Networks, Cloud Integration.

- WSU Smart Cattle Farms – Cloud-Integrated Decision Support Platform | 2025–Present

  WSU AgWeatherNet, Washington State University, USA
  - Led full-stack development of a web-based agricultural decision support platform integrating CH_4, CO_2, NH_3, and meteorological data from distributed IoT sensing networks, supporting continuous monitoring across multiple dairy farm environments.
  - Architected backend APIs, time-series data management, and interactive frontend dashboards using Python, Flask, React, MQTT, and InfluxDB, enabling remote environmental monitoring and data-driven farm management.
- SNOWi – Smart Network for Open-Field Weather and Temperature Inversion Monitoring | 2026–Present
  WSU AgWeatherNet, Washington State University, USA
  - Led development of a distributed camera monitoring system supporting a network of 56 weather-camera stations, with image acquisition at 5-minute intervals for high-resolution environmental and snow-depth monitoring.
  - Designed embedded camera-control hardware, machine learning and computer vision pipelines for automated snow-depth estimation, APIs, and a web-based administrative interface for remote configuration and network management.
  - Technologies: Computer Vision, Machine Learning, Python, Embedded Systems, REST APIs, Web Development, Remote Sensing.
- Smart Spray Vertical Patternator (SSVP-II) | 2025–Present
  PrecisionAg Laboratory, Washington State University, USA
  - Led electronic hardware design, embedded firmware development, and sensor integration of an automated agricultural spray characterization system for quantifying vertical spray-liquid distribution and associated airflow profiles generated by orchard airblast sprayers.
  - Technologies: Precision Agriculture, Embedded Systems, Sensor Instrumentation, PCB Design, Firmware Development, Automated Data Acquisition.
- Cyber-Physical System (CPS v4) for Apple Orchards | 2025
  PrecisionAg Laboratory, Washington State University, USA
  - Led design and integration of an edge-AI cyber-physical sensing platform combining custom electronics, embedded firmware, machine learning, and computer vision for automated detection of apple heat stress and sunburn damage under field conditions.
  - Technologies: Edge AI, Cyber-Physical Systems, Computer Vision, Machine Learning, Embedded Systems, Precision Agriculture.
- WeatherSonde – UAV-Based Atmospheric Profiling and Temperature Inversion Monitoring | 2024
  PrecisionAg Laboratory, Washington State University, USA
  - Developed a modular UAV-based atmospheric sensing platform integrating temperature, relative humidity, barometric pressure, GPS, and wireless telemetry with real-time mobile visualization for atmospheric inversion monitoring.
  - Technologies: UAV Systems, Embedded IoT, Wireless Telemetry, Sensor Integration, Mobile Application Development, Environmental Monitoring.
- Smart Milk Flow Meter for Dairy Calves | 2025
  Cornell University, USA
  - Led electronic hardware design, embedded firmware development, and sensor-based instrumentation of a milk flow measurement system for automated quantification of milk intake volume and drinking rate in dairy calves.

- Technologies: Embedded Systems, Sensor Instrumentation, Flow Measurement, Firmware Development, Precision Livestock Farming.

- AWN Air Quality Monitoring and Data Acquisition System | 2023–2024
  WSU AgWeatherNet, Washington State University, USA
  - Reverse-engineered environmental monitoring hardware and communication interfaces, developing embedded firmware for automated acquisition and integration of air-quality and volatile organic compound (VOC) measurements into the WSU AgWeatherNet mesonet.
  - Technologies: Reverse Engineering, Embedded Systems, Firmware Development, Environmental Sensors, Data Acquisition, IoT Integration.
- AgBot – Multisensor Hexacopter UAV Platform | 2024
  PrecisionAg Laboratory, Washington State University, USA
  - Led mechanical design, electronic hardware development, and firmware integration of a custom hexacopter UAV equipped with multispectral and thermal imaging payloads, enabling remote sensing and geospatial data visualization for environmental and agricultural applications.
  - Technologies: UAV Design, Multispectral Imaging, Thermal Imaging, Embedded Systems, Mechanical Design, Remote Sensing.
- Accelerated Reinforced Concrete Corrosion Testing Instrumentation | 2021–2022
  Department of Civil and Environmental Engineering, University of Ruhuna, Sri Lanka
  - Led development of a custom electronic instrumentation and control system, including hardware design, embedded firmware, and software integration, for accelerated experimental testing of chloride-induced reinforcement corrosion in concrete structures.
  - Technologies: Electronic Instrumentation, Embedded Systems, Firmware Development, Automated Testing, Experimental Control Systems.

KEY EXPERTISE

- PROGRAMMING & TOOLS
  • Python • Java • C++ • R • NodeJS • MATLAB • JavaScript • AWS (Amazon Web Services) • QGIS
- TECHNOLOGIES
  • Precision Agriculture/Farming • Wireless Sensing • Machine Vision • Machine Learning • Embedded Systems • Web/ Mobile App Development • IoT
- DESIGN & PROTOTYPING
  • 3D Printing and Additive Manufacturing • Prototyping and PCB Design (KiCAD, Altium Designer) CAD Design (SolidWorks, AutoCAD)

MENTORING & TEACHING EXPERIENCES

- Mentor – AgWeathernet Research/Technical assistant. Projects: SHERI, SNOWi and Patternator (2025-Present)
  - Aiden Brees (Undergraduate student, School of Electrical Engineering & Computer Science, Washington State University, USA)
- Mentor – WSU Agweathernet summer internship/volunteer. Project: Automated Surface Wiping Module for AgWeathernet Mesonet Cameras. ~3 Months. (2026)
  - Jaden Lee (High school student, Pullman High School, Pullman, USA)
- Mentor – AgAID Undergraduate Research Internship 2025. Projects: Orchard Fruit Analysis System & WeatherSonde. ~3 Months. (2025)
  - Khang Bui (Undergraduate student, School of Electrical Engineering & Computer Science, Washington State University, USA)
- Mentor – Vertical Spray Patternator (VSP). 2025/2026 WSU Global ME Capstone Project (undergraduate team, WSU School of Mechanical and Materials Engineering at Olympic College, Bremerton). ~12 Months. (2025-2026)
  - Natalie Gough (Undergraduate student)

    - Antonio Narte (Undergraduate student)
    - Gervie Sampayan (Undergraduate student)
- Mentor – UCANR Farm Robotics Challenge 2025 (Team Vysion, WSU). Weathersonde – Real-Time Vertical Atmospheric Profiling and Orchard Surface Temperature Mapping for Frost Management. ~3 Months. (2025)
    - Khang Bui (Undergraduate student, School of Electrical Engineering & Computer Science, Washington State University, USA)
    - Rishabh Goyal (Graduate student, Biological Systems Engineering, Washington State University, USA)
- Instructor: BSYSE 530 UAS Mission Planning – GNSS and RTK hands-on sessions for graduate students, Washington State University, Pullman, USA (2024)
- Instructor: Electronics, Embedded Systems, and electrical systems practical sessions and teaching assistant for undergraduate students, Faculty of Engineering, University of Ruhuna, Sri Lanka (2020-2022)

PROFESSIONAL SERVICES

- Ad-Hoc Reviewer:
    - Precision Livestock Farming in Frontiers in Animal Science
    - Computers and Electronics in Agriculture
- Tech lead/volunteer: Reverse-engineered and troubleshot military SLC-2 weapon-locating radar systems at the regiment of artillery, Army, Sri Lanka (2022).
- Instructor: Trained the technical staff and configured laboratory apparatus and trainer kits (PCB plotter, PLC trainer, Twin motor PID system, solar thermal unit, ultrasonic radar unit, Antenna trainer kit, etc.) of the Department of Electrical and Information Engineering, University of Ruhuna (2021 -2022).
- Tech lead/volunteer: Inspection and troubleshooting of ICU beds, designing new circuits, and repairing the control units of actuator controllers for the National Hospital, Galle, Sri Lanka (2021 -2022).

PROFESSIONAL MEMBERSHIPS

- Member of the American Society of Agricultural and Biological Engineers (ASABE)
- Graduate Student Member of the Institute of Electrical & Electronic Engineers (GSMIEEE)
- Member of the Institution of Engineering and Technology (IET) - MIET
- Associate Member of Institute of Engineers Sri Lanka (IESL) -AM(IESL)
- Associate Engineer of Engineering Council, Sri Lanka (ECSL) -AE(ECSL)

CERTIFICATIONS

- Federal Aviation Administration: Part 107 Small UAS Recurrent (2023,2026)
- Altium Certification & Training: Altium Designer Essentials-On Demand (2026)
- Altium Certification & Training: Altium Workspace User Management (2026)
- Federal Aviation Administration: The Recreational UAS Safety Test (TRUST) (2024)

PROFESSIONAL DEVELOPMENT/ EXTRA-CURRICULAR

- Volunteer, ASABE 2026 Annual International Meeting, Indianapolis, IN, USA (2026).
- Co-lead and organized Climate-Smart Dairy Farming: Research & Demonstration. Smart Dairy Field Day, Royal Dairy, Royal City, WA, USA (2025).
- Secretary – American Society of Agricultural and Biological Engineers (ASABE SEB), Washington State University. USA (2023).
- Runners-up in the IEEE Circuit Design Competition for university undergraduate students, organized by the Institute of Electrical & Electronic Engineers Sri Lanka Section (2014).
- Chapter Main Organizer - IEEE Student Branch, Faculty of Engineering, University of Ruhuna, Sri Lanka (2017).

- Chapter Treasurer of IEEE Ruhuna chapter, Faculty of Engineering, University of Ruhuna, Sri Lanka (2016).
- Publicity committee leader of Ex-com, IEEE Ruhuna chapter, University of Ruhuna, Sri Lanka (2015).
- Volunteer at XbotiX –Robotics Challenge & IET PATW Conference, Faculty of Engineering, University of Ruhuna, Sri Lanka (2016 & 2017).