# Hamid Syed

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## EDUCATION

**Auburn University – (Alabama, USA)** *July 2027*
Ph.D. in Biosystems Engineering *GPA: 3.86/4.0*

**Auburn University – (Alabama, USA)** *December 2025*
Master of Science in Data Science and Engineering *GPA: 3.86/4.0*

**Air University Islamabad (Islamabad, Pakistan)** *December 2022*
Master of Science in Electrical Engineering *GPA: 3.52/4.0*

**University of Engineering & Technology Peshawar (Peshawar, Pakistan)** *October 2020*
Bachelor of Science in Electrical Engineering *GPA: 3.62/4.0*

## ACADEMIC EXPERIENCE

**Graduate Research Assistant – Auburn University** *May 2023 – Present*
- Researching AI integration in Agriculture Inventory Management
- Developing dynamic unmanned ground vehicle (UGV) for spraying
- Creating Drone based weed detection system
- Designing UAV and UGV based optimized spraying system

**Graduate Teaching Assistant (BSEN 3610) – Auburn University** *January 2025 – May 2025*
- Responsible for conducting laboratory experiments
- Monitored instrumentation and control projects of undergraduates

**Graduate Research & Teaching Assistant – Air University Islamabad** *September 2020 – September 2022*
- Conducted research and published a conference paper
- Conducted undergraduate laboratory lectures
- Tutored and mentored undergraduate students

## PROFESSIONAL EXPERIENCE

**AIOPs (Mobile, Alabama)** *May 2024 – August 2024*
*Machine Learning Intern*
- Research and Development
- Reinforcement learning control of commercial/industrial equipment
- Research on Proximal Policy Optimization and Multi-Agent Learning

**Datapoint – Airloop (Islamabad, Pakistan)** *October 2022 – April 2023*
*AI Engineer*
- Designed pavement crack detection and applied Geo mapping
- Developed commercial-level Traffic Analytics model
- Managed and supervised the AI team
- Developed a prototype for UAV-based pavement crack detection system

*AI Engineer Intern*
- Developed a prototype for UAV-based pavement crack detection system

**Pakhtunkhwa Energy Development Organization (Swat, Pakistan)** *June 2018 – July 2018*
*Electrical Engineer Intern*
- Understanding the design and construction of "run of the river" dam (36.6MW)

## SCHOLARLY WORK

- Reviewer, Sensors International
- Judge for the Capstone Design Research showcase (Auburn - 2024)
- Declared and Certified as a Member of Alpha Epsilon (The Honor Society of Biological Engineering)
- Attended and presented at the American Society of Agricultural and Biological Engineers (ASABE) annual meeting in Nebraska-2023, and Los Angeles, California-2024.
- Attended and presented at the International Conference on Precision Agriculture (ICPA) 2024, Kansas, USA.

## PUBLICATIONS

1. **Syed Hamid** and M H Mahmood**,** "3D Human Reconstruction with Corresponding 3D Texture Model: A Comparison of Salient Approaches" (ICETECC - 2022)
2. MH Rahman, **Syed Hamid**, and Rehman et al., "Forecasting Growth Dynamics of Hydroponic Kale in Controlled Environment Agriculture through Vision-Based Phenotyping and Time-Series Modeling" (Smart Agricultural Technology - 2025)
3. **Syed Hamid et al.,** "Automated in-field inventory management and quality assessment system using end-to-end deep learning for ornamental nursery crops", (Smart Agricultural Technology - Under Review)
4. **Syed Hamid et al.,** "Exploring 3D Latent Feature Embedding for Few and Single-Shot Unsupervised Person Re-Identification (Sensors International - Under Review)
5. Ahmad, Faraz, **Syed Hamid**, and Rehman et al., "Autonomous Robotic Navigation in Ornamental Crop Production Using Vision and Sensor Fusion" (Computer Electronics in Agriculture - Under Review)
6. Rafi, Mohtasim, **Syed Hamid**, and Rehman et al., "Cloud-Enabled Plant Segmentation and Tracking Framework for Ornamental Nursery Inventory Management" (Computer Electronics in Agriculture - Under Review)
7. Waseem, Muhammad, **Syed Hamid**, and Rehman et al., "Transforming Agriculture with Cyber-Physical Systems: An Insight into Future Smart Farming" (Smart Agricultural Technology - Under Review)
8. Waseem, Muhammad, **Syed Hamid**, and Rehman et al., "Generative AI-Based Digital Twin Pipeline for Advanced Agricultural Analytics Enabled by Synthetic Data and Zero-Shot Learning" (Computer Electronics in Agriculture - Under Review)
9. Book Chapter: Ahmad Fayaz, Ruihong Zhang, and **Syed Hamid et al**. "The Art of Doing Research" (Under Review)

## PRESENTATIONS

**Oral Presentation**

- **Syed Hamid.** & Rehman, T. U. (2024). "Smart Inventory Management and Quality Assurance System for Ornamental Plants". Auburn Research Symposium, Auburn, Alabama, USA. March 26, 2024. (**WINNER**)
- **Syed Hamid et al.,** "Proactive Resource Efficiency via Coordinated Imaging and Sprayer Execution (*PRECISE*)". NASA AgAir Competition, USA. May 21, 2025. (**FINALIST**)

**Poster Presentation**

- **Syed Hamid.** & Rehman, T. U. (2024). "A label-free deep learning approach for ornamental nursery inventory management". Data Science and AI in Production Agriculture, Auburn, Alabama, USA. April 26, 2025. (**WINNER**)
- **Syed Hamid.** & Rehman, T. U. (2023). "Automated In-field Ornamental Nursery Plant Counting and Quality Assessment With End-to-End Deep Learning for Inventory Management". College of Agriculture Graduate Research Poster Showcase, Auburn, Alabama, USA. October 26, 2023. (**WINNER**)

## AWARDS

- Finalist in NASA AgAir Competition and a stipend of $9000. (May 2025)
- Winner of Poster Competition at "Data Science and AI in Production Agriculture" and a cash prize of $500 (March 2024)
- Excellence in Productivity Award at the Farm Robotics Challenge at FIRA - World Ag Robotics Forum and a cash prize of $5000 (October 2024)
- Recipient of FFAR Fellowship (August 2024)
- Nominated for Graduate School Merriwether Fellowship Award (Auburn – 2024)
- Winner of Auburn Research Symposium Oral Presentation(Auburn - March 2024)
- Winner of Graduate Student Poster Competition (Auburn - Nov 2023)
- Winner of National Idea Bank Competition (Natural Resources Sector – 2021)
- Merit based full fee waiver (2020 – 2022)
- Recipient of National Talent Scholarship (2016 – 2020)
- Merit based tuition fee waiver (2014 – 2016)

## SKILLS

- Programming Languages: Python, MATLAB, R, C++, LaTeX
- Libraries and Frameworks: OpenCV, NumPy, Pandas, Matplotlib, Scikit-learn, object detection API
- Design: AutoCAD, Proteus, PSpice
- Developer Tools: Linux, JupyterLab, Pycharm, Visual Studio Code
- Hardware: RTX 5090, Jetson Orin, Micro Controller 8051, Esp 702 Micro Controller
- Photogrammetry and Reconstruction: NVIDIA Omniverse, NuRec, Pix4DMapper, Pix4d Fields, DJI Terra, Correlator3D, Agisoft, ArcGIS Pro,
- Experienced with small UAVs, large UAVs, unmanned ground vehicles as well as their applications

## CERTIFICATIONS

- Certified UAV Remote Pilot (Federal Aviation Association)
- Pesticide Applicator Permit (Alabama Department of Agriculture & Industries)

## PROJECTS

**Ornamental Nursery Inventory Management System (Ph.D. Research Project)**

- Developing an Unmanned Ground Vehicle based data collection and analysis pipeline
- Developing deep learning and statistics-based model for plant counting and quality assessment
- Integrating NVIDIA Omniverse and NuRec for generating synthetic nursery environments

**Unmanned Aerial Vehicle (UAV) based Weed Detection System (Ph.D. Research Project)**

- Data collection and analysis using different UAVs (Phantom4M and Mavic3M)
- Build a digital twin pipeline to generate synthetic datasets for training agricultural vision systems
- Generating photogrammetry and processing multispectral imagery using deep learning techniques

**UAV and UGV based Smart Spraying System (Ph.D. Research Project)**

- Using camera modalities and different software for spray path generation
- Smart Spraying by utilizing embedded systems and deep learning-based object segmentation models.

**Development of Deep Learning based Pavement Condition Index, Survey, GIS mapping, and reporting of 5000 kms of roads in Khyber Pakhtunkhwa. (Corporate Project - 2023)**

- Development of a deep learning-based pavement condition index (PCI) for assessing the condition of roads
- Use of GIS mapping technology to analyze and visualize the collected data, allowing for efficient identification of problematic areas and prioritization of maintenance and repair efforts.

**Deep Learning Based Road Traffic Analytics system based on axle-load. (Corporate Project - 2023)**

- Collection and annotation of a diverse novel dataset, which consists of 33 different classes
- Implementation of the system at strategic locations, such as toll booths or weigh stations, to collect data on vehicle traffic and ensure compliance with weight limits

**Exploring a 3D Latent Feature Space Embedding, for Person Re-identification (MS Thesis Project - 2022)**

- Explored 3D latent Space, transformed 2D images into 3D Images embedding, and utilized it for person Re-Identification.
- Proposed a Novel Method for 3D Person Re-Identification that mimics the Human Brain functionality.