Dhe Yeong Tchalla

Ph.D. Student in Computer Science
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Brookings, SD

Research Interests

- Computer vision for robotics and autonomous systems, distributed and federated learning, and multi-agent AI systems.

Education

- **South Dakota State University** — Brookings, SD
  Ph.D. in Computer Science — *Jan 2026 – Present*
- **South Dakota State University** — Brookings, SD
  Master of Science in Computer Science — *Aug. 2023 – Nov. 2025*
  - Thesis: *ST-Hybrid: Dynamic Graph Learning with Multi-Scale Spatio-Temporal Attention for Traffic Forecasting.*
- **Sun Moon University** — South Korea
  Bachelor of Science in Computer Science — *Mar. 2019 – Feb. 2023*

Publications

- **Dhe Yeong Tchalla**. *ST-Hybrid: Dynamic Graph Learning with Multi-Scale Spatio-Temporal Attention for Traffic Forecasting.* ACR 2025. Published.
- Pappy Yadav, ..., **Dhe Yeong Tchalla**, et al. *AI-driven Web Application for Early Detection of Sudden Death Syndrome (SDS) in Soybean Leaves Using Hyperspectral Images and Genetic Algorithm.* Published.
- **Dhe Yeong Tchalla**, et al. *3D Phenotyping of Soybean with AI, RGB-D Sensor and PhenAI-Bot in Greenhouse.* Manuscript in preparation, 2026.

Research Experience

- **AI Research Assistant** — Brookings, SD
  Machine Vision and Optical Sensor (MVOS) Lab, South Dakota State University — *Sep. 2025 – Nov. 2025*
  - Conducted research on AI-based sensing and automation using robotics, unmanned ground vehicles, and unmanned aerial systems.
  - Developed C, C++, and Python scripts for processing RGB, multispectral, and hyperspectral crop imagery.
  - Collaborated with the research team on algorithm development, experimental testing, and automation workflows.
- **AI Research Intern** — Brookings, SD
  Machine Vision and Optical Sensor (MVOS) Lab, South Dakota State University — *May 2025 – Aug. 2025*
  - Designed core components of an autonomous RGB-D phenotyping platform, improving data capture efficiency by 25%.
  - Integrated synchronized RGB-D sensors, reducing measurement noise by 20% and improving trait-estimation stability.
  - Implemented deep-learning segmentation and morphology pipelines, increasing trait identification precision by 15%.
  - Conducted comparative model evaluations and error analyses to identify models suitable for deployment.
- **Student Researcher** — Brookings, SD
  Raven Precision Agriculture Center, South Dakota State University — *Oct. 2023 – Apr. 2025*
  - Developed a YOLOv9-based model for real-time seed identification with GPS-based spatial mapping.
  - Trained and optimized a U-Net variant for semantic segmentation of wheat diseases.
  - Engineered and launched an internal web platform to showcase more than five research projects and improve lab visibility.

Professional Experience

- **Software Developer Intern** — Seoul, South Korea
  GKES Korea — *Jun. 2022 – Aug. 2022*
  - Implemented 32 software design patterns in practical software-development contexts.
  - Developed a multi-client chat application and gained experience with object-oriented programming.
  - Worked with IMAP/POP, ICMP/SNMP protocols, and Linux virtual server management.

Selected Research Projects

- **Multi-Agent AI System for Android UI Automation**: Architected a Planner/Executor/Verifier/Supervisor system for autonomous Android UI testing using Python, GPT-4 API, ADB, and OpenCV. Integrated screenshot hashing and visual diffing, reducing manual QA effort by approximately 70%.
- **Intelligent Research Assistant with MCP**: Developed a multi-agent research assistant using Python, Model Context Protocol, GPT-4, FastAPI, and retrieval-augmented generation. Built semantic search over academic papers and documentation, reducing literature-review time by 40%.
- **Type-Safe and Extensible Architecture for Hospital Management Systems**: Designed a modular hospital management system using enhanced Factory-Adapter-Decorator patterns to support evolving roles and operations with compile-time type safety. Used generics, decorators, adapters, DAGs, and Method Dependency Graphs to improve maintainability, extensibility, and type consistency.
- **Enterprise Workflow Automation with n8n**: Designed and deployed an automated workflow system using n8n, Node.js, PostgreSQL, and Docker to handle more than 500 daily operations. Integrated internal APIs, CRM systems, notification services, error handling, and monitoring.
- **Payment Gateway System**: Built an application for fee-free money transfers across multiple payment gateways. Integrated PayPal, Kakao Pay, and Toss APIs for real-time currency exchange and cross-gateway communication.

Technical Skills

- **Programming Languages**: Python, Java, JavaScript, SQL, C/C++, C#
- **AI/ML**: PyTorch, TensorFlow, scikit-learn, OpenCV, computer vision, deep learning
- **Robotics and Automation**: ADB, sensor integration, RGB-D sensing, unmanned ground vehicles, unmanned aerial systems
- **Web Development & APIs**: React, Next.js, Node.js, Spring Boot, FastAPI, REST APIs, ASP.NET
- **Cloud & DevOps**: AWS Lambda, API Gateway, S3, SageMaker, Docker, Git, Linux
- **Databases**: PostgreSQL, MySQL, SQL Server, Firebase, Redis
- **Software Engineering**: Object-oriented programming, software design patterns, API design, agile methodology
- **Tools**: Jupyter, Visual Studio, Eclipse, Apache Tomcat