MUYLEANG ING



AI & Quantum Computing Researcher · Instructor & DevOps Engineer

Quantum Computing Laboratory, Pukyong National University, Busan, South Korea
Nationality: Cambodian (Khmer) · Date of birth: 8 July 2001

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RESEARCH SUMMARY

Master's student in AI Convergence and researcher in the Quantum Computing Laboratory at Pukyong National University, working on quantum circuit compilation, resource-efficient quantum simulation, and hardware-aware quantum machine learning. My current work, Q-MaskCut, is a circuit-cutting-based compilation method that protects quantum circuits by partitioning them into masked subcircuits; a journal manuscript on this work is in preparation. I combine this research background with three years of industry teaching and DevOps engineering experience in Cambodia, and I lead KhmerStack, an open-source community building developer tools for Khmer developers.

RESEARCH INTERESTS

Quantum circuit compilation and cutting · Quantum circuit obfuscation and IP protection · Quantum simulators and resource-efficient simulation · Quantum machine learning (QCNN, QRL — prior experimental studies) · Deep learning · Quantum–classical hybrid models for drug discovery

EDUCATION

M.S. in AI Convergence 2025 – Present (expected 2027)
Pukyong National University, Busan, South Korea

Quantum Computing Laboratory (QCL), advisor: Prof. Youngsun Han

Research: quantum compiler design, quantum circuit cutting, quantum simulators, hardware-aware QML

Full Stack Web Development Program (ITE Generation 1) 2023
Institute of Science and Technology Advanced Development (ISTAD), Phnom Penh, Cambodia

Basic Course (800 h): Java OOP, React, Next.js, Spring Boot, PostgreSQL, Git, Docker, NGINX — **Top 1 team project (SurveyBox)**

Advanced Course (616 h): Linux, Kubernetes, ArgoCD, Helm, Terraform, Vault, Prometheus/Grafana, DevSecOps, CI/CD — **Top 2 team project (AutomateX)**

B.S. in Computer Science 2019 – 2023
Royal University of Phnom Penh, Cambodia

Coursework: C/C++, Java, VB.NET, SQL Server, MySQL, ASP.NET, Java Web, Software Engineering

BacII Diploma (High School) 2016 – 2019
Paññāsāstra International School (PSIS), Phnom Penh, Cambodia

Top 2 — Mathematics Award

PUBLICATIONS & MANUSCRIPTS

Journal manuscript (in preparation)

- **Muyleang Ing**, Leanghok Hour, Youngsun Han. *Q-MaskCut: Protecting Quantum Circuits through Masked Circuit Cutting* (working title). Manuscript in preparation for journal submission, 2026.

Conference papers

- Leanghok Hour, **Muyleang Ing**, Youngsun Han. *Resource-Efficient Simulation of Large Quantum Circuits Using Circuit Partitioning and Qubit Reuse*. **ICCE-Asia 2025**, Busan, South Korea.
- Tara Kit, Leanghok Hour, **Muyleang Ing**, Youngsun Han. *A Resource-Efficient Quantum-Classical Model for Protein–Ligand Binding Affinity Prediction*. Submitted, under review.

CURRENT RESEARCH

Q-MaskCut — Quantum circuit protection via masked circuit cutting Sep 2025 – Present (2nd semester onward)
Quantum Computing Laboratory, Pukyong National University (M.S. thesis research)

- Designed a compilation method that cuts a quantum circuit into masked subcircuits so that the circuit's structure is protected from untrusted compilers and hardware providers while remaining executable.

- Benchmarked against ECQCO (the main baseline) using normalized graph edit distance (normGED), total variation distance (TVD), and fidelity change to quantify both obfuscation strength and functional preservation.
- Started in the second semester of the M.S. program; thesis targeted for the 2026 second-semester examination, with a journal manuscript in preparation.

Resource-efficient quantum circuit simulation 2025
With Leanghok Hour and Prof. Youngsun Han

- Contributed to a circuit-partitioning and qubit-reuse approach for simulating large quantum circuits with reduced memory; published at ICCE-Asia 2025.

Exploratory studies: Quantum RL (QRL) and Quantum CNN (QCNN) Mar – Aug 2025 (1st semester)
Quantum Computing Laboratory, Pukyong National University

- Experimental study of quantum-enhanced reinforcement learning algorithms for optimization problems in quantum environments.
- Implemented and benchmarked quantum convolutional neural networks for image classification and pattern recognition; this hands-on QML experience informed the later Q-MaskCut thesis work.

CONFERENCES ATTENDED

- **Quantum Resources 2026** — Nihonbashi Hall, Tokyo, Japan, March 16–20, 2026.
- **9th International Conference on Quantum Techniques in Machine Learning (QTML 2025)** — Singapore, November 16–21, 2025. Theme: AI for Quantum, Quantum for AI.
- **ICCE-Asia 2025** — Busan, South Korea (co-author, paper presented).

PROFESSIONAL EXPERIENCE

Graduate Researcher 2025 – Present
Quantum Computing Laboratory, Pukyong National University, Busan

- Research on quantum compiler and simulator design and hardware-aware quantum machine learning optimization.

Instructor, DevOps Engineer & Project Mentor Jan 2024 – Present
ISTAD (Institute of Science and Technology Advanced Development), Phnom Penh

- Teach DevOps, Web Design, Python, and Database courses; develop IT curriculum and serve as final-project mentor.
- Lead and mentor student teams through full-stack development and cloud deployment: ISTAD Alumni (Next.js, Spring Boot, Elasticsearch, Jenkins), DealKh (deals and coupons platform), FluentFlow (AI-powered English learning, FastAPI/Kafka), Cloudinator (Kubernetes DevOps platform), CSTAD Website and CSTAD Verify (certificate verification).
- Explore DevSecOps integration and microservices optimization for scalable, efficient deployment pipelines.

Research Collaborator (outsourced project) 2024
Pukyong National University, South Korea

- Algorithm analysis and model development in PyTorch/C++ for a flooding-detection AI project.

Student Project Developer Feb 2023 – Jan 2024
ISTAD, Phnom Penh

- SurveyBox — survey and article platform (Next.js, Spring Boot, PostgreSQL, Docker); Top 1, Basic Course.
- AutomateX — DevOps automation platform (Jenkins, Kubernetes, Ansible, IaC); Top 2, Advanced Course.

Mobile Frontend Developer (Freelance) 2021 – 2023
Phnom Penh, Cambodia

- UX/UI design and feature development for Flutter mobile applications; QA testing and defect reporting for a mobile app (2021).

OPEN-SOURCE & PERSONAL PROJECTS

- **MekongTunnel** (Founder) — local tunnel/exposure tool with CLI, SDK, and editor integrations; published on VS Code Marketplace, JetBrains Marketplace, npm, and PyPI. mekongtunnel.dev
- **KhmerStack** (Founder) — open-source organization building practical developer tools for the Khmer developer community. github.com/KhmerStack
- **ClipVault** — local-first cross-platform clipboard manager (Electron, React).
- **kForge** — multi-platform Docker image build CLI powered by BuildKit.
- **Stack Forge** — visual builder that generates install scripts for DevOps platform setups.

TECHNICAL SKILLS

Quantum & ML	Quantum circuit compilation and cutting, quantum simulators, Qiskit, PyTorch, deep learning, quantum machine learning
Languages	Python, C/C++, Java, TypeScript/JavaScript, SQL, Bash/Groovy
Backend & Web	Spring Boot, FastAPI, Flask, Django, Node.js, React, Next.js, Tailwind CSS
DevOps & Cloud	Linux, Docker, Kubernetes, Jenkins, ArgoCD, Helm, Terraform, Ansible, CI/CD, DevSecOps, Prometheus & Grafana
Data	PostgreSQL, MongoDB, Redis, Elasticsearch, Kafka
Languages spoken	Khmer (native), English (professional)

AWARDS & HONORS

- Top 1 team project (SurveyBox), ISTAD Basic Course, 2023
- Top 2 team project (AutomateX), ISTAD Advanced Course, 2023
- Top 2 — Mathematics Award, Paññāsāstra International School, 2019

REFERENCES

Prof. Youngsun Han — Advisor, Quantum Computing Laboratory, Pukyong National University, Busan, South Korea
Mr. Chen Phirum — Director, Center of Science and Technology Advanced Development (ISTAD), Phnom Penh, Cambodia · +855 12 998 919 · phirum.itl@gmail.com