# THANH LINH NGUYEN

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*Final-Year Ph.D. Candidate in Computer Science | Seeking an AI internship position starting from June 2027*

## EDUCATION

**Trinity College Dublin, The University of Dublin** — *Dublin, Ireland*
*Ph.D. in Computer Science (School of Computer Science & Statistics)* — *Sep. 2023 - Aug. 2027 (Expected)*

- **Topics:** Federated Learning, Machine Unlearning, Game-Theoretic Mechanism Design

**Posts and Telecommunications Institute of Technology (PTIT)** — *Hanoi, Vietnam*
*B.Eng. in Electronics and Telecommunications* — *Aug. 2017 - Mar. 2022*

- **GPA:** 3.36/4.0 (Top 1%) | **Thesis:** Adaptive Collision Avoidance MAC Protocol for IoT Networks

## TECHNICAL SKILLS

**AI/ML:** Federated Learning/Unlearning, LLM Systems, Adversarial Privacy Auditing, Generative Data Synthesis
**Programming & Quantitative:** Python, Go, C/C++ | Game Theory, Mathematical Optimization, Mechanism Design
**ML Frameworks & HPC:** PyTorch, TensorFlow, Flower (FL), Hugging Face (Transformers, PEFT), Kubeflow, Docker, Kubernetes, AWS, Terraform, GitLab CI

## WORK EXPERIENCE

**COIN Laboratory, Trinity College Dublin** — *Dublin, Ireland*
*Ph.D. Research Assistant* — *Sep. 2023 - Aug. 2027 (expected)*

**PDF: Path-Dependent Client Selection for Scalable Federated Unlearning**

- Designed a training trajectory-weighted data-influence and fine-tuning framework that identifies high-value retained data subsets, cutting unlearning compute time by **57-61%** and communication costs by ∼**69%** relative to retraining.
- Built a PyTorch evaluation pipeline on Kubeflow (Kubernetes) across non-IID FMNIST, CIFAR-10, and CIFAR-100, achieving **0% target forgetting accuracy** (verified against Membership Inference Attacks) and up to **+6.91% higher retained accuracy** over state-of-the-art unlearning baselines.
- **Outputs:** 1 accepted workshop paper (*NeurIPS 2026 NewInML*) and 1 conference paper submitted (*ICLR 2027*).

**CoCoGen+: Generative Data Synthesis & Mechanism Design for Cross-Silo Federated Learning**

- Architected a strategic synthetic data generation and payoff redistribution framework solving the cross-silo coopetition dilemma where shared model updates risk strengthening market competitors.
- Formulated strategic multi-organization training as a weighted potential game with guaranteed Nash equilibrium convergence, leveraging generative AI to mitigate non-IID divergence while protecting proprietary client utility.
- Validated on FMNIST, CIFAR-10, and CIFAR-100 in PyTorch, consistently outperforming competition-aware baselines in both **global test accuracy** and **system-wide social welfare** while preventing client drop-out.
- **Outputs:** 1 published conference paper (*IEEE GLOBECOM 2025*) and 1 journal submitted (*IEEE TMC*, IF: 9.2).

**R3T: Temporal Contract-Based Contribution Evaluation & Incentivization [GitHub]**

- Designed a Critical Learning Period-aware, contract-theoretic contribution valuation and incentive mechanism for federated learning across privacy-sensitive enterprise domains (e.g., finance, healthcare).
- Accelerated training convergence by **300%** and improved test accuracy by up to **9%** over baselines by strategically allocating rewards during critical training epochs via PyTorch, Go, and Ethereum smart contracts.
- **Outputs:** 1 published journal paper (*IEEE TNSE 2026*, IF: 7.9) and 1 published conference paper (*IEEE VTC2025*).

**FlowerSeed: Privacy-Preserving Federated AI Agents [GitHub]**

- Developed a federated multi-agent AI application using the Flower framework to synthesize cross-facility clinical insights without centralizing sensitive patient records (Flower Labs Agent Hackathon, Cambridge).

**Delft University of Technology (TU Delft) & Montimage EURL** — *Delft, Netherlands & Paris, France*
*Visiting Researcher (EU Horizon MSCA ENSURE-6G)* — *Jun. – Aug. 2025 & Jul. – Aug. 2026*
**VeriFUL: Verifiable Federated Unlearning & Privacy Attack Auditing**

- Proposed the first verifiable federated unlearning architecture enabling cryptographic and statistical auditing of data removal from deployed ML models.
- Implemented Membership Inference Attacks (MIA) and adversarial threat evaluations to audit unlearning efficacy and quantify accuracy-privacy-latency trade-offs across distributed edge nodes.
- **Outputs:** 1 published magazine paper (*IEEE Internet Computing 2026*, IF: 3.3) and 1 published survey paper (*IEEE Communications Surveys & Tutorials 2026*, IF: 50.4).

**FPT Software** *Hanoi, Vietnam*
*DevOps & Cloud Software Engineer* *May 2022 - Nov. 2022*
**Boeing Production CI/CD Pipeline & Cloud Infrastructure Optimization**

- Architected and deployed automated CI pipelines for BOEING internal microservices using Go, GitLab CI, Docker, Terraform, and AWS.

**Posts and Telecommunications Institute of Technology (PTIT)** *Hanoi, Vietnam*
*Undergraduate Research Assistant* *Mar. 2020 - Mar. 2022*
**Edge-AI Computer Vision Deployment & Network Optimization**

- Developed a real-time deep learning face-recognition and thermal screening pipeline on Raspberry Pi edge devices integrated with the ThingsBoard IoT platform.
- **Outputs:** 2 published IEEE conference papers (*IEEE ATC 2021*) and 1 domestic journal article.

**HADTech Joint Stock Company & VCCorp (Bizfly Cloud)** *Hanoi, Vietnam*
*Cloud Computing Engineer Intern* *Oct. 2019 - Jul. 2020*

- Engineered containerized microservices with Docker and Kubernetes and deployed a Prometheus/Grafana observability stack across a multi-node Kubernetes cluster. **[GitHub]**

## SELECTED PUBLICATIONS

4 published journal/magazine articles, 5 published conference/workshop articles, 2 under review. See Google Scholar.

**Journal & Magazine Publications**

1. **Thanh Linh Nguyen**, Nguyen Van Huynh, and Quoc-Viet Pham, "Cooperate to Compete: Strategic Data Generation and Incentivization Framework for Coopetitive Cross-Silo Federated Learning," *major revision* in *IEEE Transactions on Mobile Computing (TMC)*, 2026 (**IF: 9.2**).

2. **Thanh Linh Nguyen**, Dinh Thai Hoang, Diep N. Nguyen, and Quoc-Viet Pham, "Carpe Diem: Critical Learning Period-Aware Contract-Based Incentives for Federated Learning," *IEEE Transactions on Network Science and Engineering (TNSE)*, vol. 13, pp. 10863–10881, 2026 (**IF: 7.9**). **[GitHub]**

3. **Thanh Linh Nguyen**, Marcela Tuler de Oliveira, An Braeken, Aaron Yi Ding, and Quoc-Viet Pham, "Towards Verifiable Federated Unlearning: Framework, Challenges, and The Road Ahead," *IEEE Internet Computing*, vol. 30, no. 1, pp. 59–70, 2026 (**IF: 3.3**).

4. **Thanh Linh Nguyen**, Lam Nguyen, Thong Hoang, Dilum Bandara, Qin Wang, Qinghua Lu, Xiwei Xu, Liming Zhu, and Shiping Chen, "Blockchain-Empowered Trustworthy Data Sharing: Fundamentals, Applications, and Challenges," *ACM Computing Surveys*, vol. 57, no. 8, Article 195, 2025 (**IF: 30.4**).

**Conference Publications**

1. **Thanh Linh Nguyen** and Quoc-Viet Pham, "PDF: Path-Dependent Client Selection for Federated Unlearning," submitted to *International Conference on Learning Representations (ICLR)*, California, US, 2027.

2. **Thanh Linh Nguyen** and Quoc-Viet Pham, "Not All Retained Clients Are Equal: Client Selection for Federated Unlearning," *Conference on Neural Information Processing Systems (NeurIPS) NewInML Workshop*, Paris, France, 2026.

## HONORS AND AWARDS

- **Horizon Europe MSCA Staff Exchange Fellowship (ENSURE-6G)** | *European Commission* *2025, 2026*
- **Third Prize, Balbriggan EcoCore Innovation Hackathon** | *Fingal County Council, Ireland* *Nov. 2024*
- **Fully Funded Ph.D. Scholarship** | *Research Ireland ADVANCE CRT & Trinity College Dublin* *Sep. 2023*
- **Third Prize, National Scientific Research Student Contest** | *Ministry of Education & Training, Vietnam* *Dec. 2021*