Pawissanutt Lertpongrujikorn

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SUMMARY

Computer Science Ph.D. with 4+ years of R&D experience in distributed systems, serverless computing, and cloud-native architecture. Pioneered the Object-as-a-Service (OaaS) paradigm, delivering significant performance gains in cloud application development. Proven expertise in designing scalable architectures and optimizing complex systems using Kubernetes, Java, Rust, and Python. Published author in top-tier venues including IEEE TC, SoCC, and ICDCS.

EDUCATION

University of North Texas, Denton, TX   2021 – 2025
Doctor of Philosophy – PhD, Computer Science and Engineering
Master of Science – MS, Computer Science
(Program initiated at the University of Louisiana at Lafayette, 2021-2023)

Kasetsart University, Bangkok, Thailand   2015 – 2019
Bachelor of Engineering – BE, Computer Engineering

RELEVANT EXPERIENCE

HPCC Lab   Aug 2021 – Present
Research Assistant   Denton, TX

- **Object-as-a-Service (OaaS) (NSF-Funded Project) [○]**:
    - **Problem:** Serverless functions lack native state and workflow management, forcing developers to implement complex, error-prone boilerplate for data consistency and access control.
    - **Solution:** Pioneered the OaaS paradigm and engineered "Oparaca" platforms using **Java, Rust, and Python** on **Kubernetes/Knative**. Implemented a unified object abstraction that encapsulates logic, state, and QoS requirements, utilizing **Kafka/Zenoh** for messaging and **Minio (S3)** for storage.
    - **Result:** Achieved **2.27x lower latency** and **3.27x higher throughput** compared to Knative by optimizing data locality and reducing database bottlenecks.
    - **Edge Extension [○]:** Extended the platform to the Edge-Cloud continuum, enabling developers to **declaratively configure** complex QoS requirements like **high availability (e.g., 99.999%)** and **consistency levels (e.g, strong, eventual)** without changing code. Validated by a human study to **boost developer productivity by 31%**, reducing boilerplate code by **45%** and configuration complexity by **90%**.
- **Action Engine [○]**:
    - **Problem:** Generating complex serverless workflows requires specialized knowledge and is prone to errors, with existing solutions often tied to specific vendors.
    - **Solution:** Developed a tool-augmented LLM system to automatically generate platform-agnostic FaaS workflows from natural language, featuring a novel "Func Identifier" and "DAG Compiler".
    - **Result:** Achieved a **100% pass rate** for syntactically valid workflows and a **42% F1 score** in function selection for complex scenarios, significantly outperforming baseline methods.
- Built automated scripts to streamline research testbed creation in **Chameleon Cloud** using **Terraform** and **Ansible**.
- Mentored multiple Ph.D. students, providing technical guidance on distributed systems and research methodologies.

ByteArk   Jun 2019 – Jul 2021
Software Engineer   Bangkok, Thailand

- Engineered and launched a **Low-Latency HLS (LL-HLS)** service, reducing end-to-end latency to <2 **seconds** (screen-to-screen), enabling real-time interactivity for live events.
- Engineered a distributed load testing framework for Pub/Sub systems, simulating **over 50,000 concurrent virtual users** to identify bottlenecks and ensure reliability during high-traffic live events.
- Developed a **Dynamic Ad Insertion (DAI)** engine for HLS, implementing **server-side manifest manipulation** to enable seamless, buffer-free ad stitching for live streams.
- Architected a **dynamic priority queueing system** for video transcoding, enabling **seamless real-time priority switching** to accommodate urgent customer requests, ensuring critical SLAs were met without pipeline disruption.
- Modernized deployment infrastructure by implementing **automated CI/CD pipelines** using **GitLab CI and Ansible**, eliminating manual errors and ensuring consistent, reproducible releases across all environments.

- Conducted in-depth research into video transcoding configurations to optimize transcoding time and streaming bandwidth.

University of Louisiana at Lafayette   Jan 2022 – May 2023
Teaching Assistant   Lafayette, LA
- Assisted in teaching **Distributed Computing Systems**; guided students in setting up **AWS** cloud environments.

⚒ SKILLS

- **Core Competencies:** Distributed Systems, Serverless Computing, Cloud-Native Architecture, Microservices, System Design, Performance Optimization, Load Testing, Video Streaming (FFmpeg, HLS, DASH)
- **Languages & Protocols:** Java, Rust, Python, TypeScript, SQL, Bash, gRPC, Protobuf, REST, WebSocket
- **Cloud & DevOps:** Kubernetes, Knative, Docker, AWS, Linux, Terraform, Ansible, GitLab CI, GitHub Actions, Prometheus, Grafana, OpenTelemetry
- **Data & Messaging:** Kafka, Zenoh, MQTT, Redis, MongoDB, ArangoDB, MinIO (S3), Infinispan

📓 SELECTED PUBLICATIONS

- **Lertpongrujikorn, Pawissanutt**, and Mohsen Amini Salehi. "Object as a service (OaaS): Enabling object abstraction in serverless clouds." *2023 IEEE 16th International Conference on Cloud Computing (CLOUD).* IEEE, 2023.
- **Lertpongrujikorn, Pawissanutt**, and Mohsen Amini Salehi. "Tutorial: Object as a Service (OaaS) Serverless Cloud Computing Paradigm." *2024 IEEE 44th International Conference on Distributed Computing Systems Workshops (ICDCSW).* IEEE, 2024.
- **Lertpongrujikorn, Pawissanutt**, Hai Duc Nguyen, and Mohsen Amini Salehi. "Streamlining Cloud-Native Application Development and Deployment with Robust Encapsulation." *Proceedings of the 2024 ACM Symposium on Cloud Computing.* 2024.
- Esashi, Akiharu, **Pawissanutt Lertpongrujikorn**, Shinji Kato, and Mohsen Amini Salehi, "Action Engine: Automatic Workflow Generation in FaaS," *Future Generation Computer Systems* (2026): 107947.
- **Lertpongrujikorn, Pawissanutt**, and Mohsen Amini Salehi. "Object as a Service: Simplifying Cloud-Native Development through Serverless Object Abstraction." *IEEE Transactions on Computers*, 2025, accepted in Oct. 2025, In press.