

Dwi P. A. Nugroho

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Professional Summary

PhD researcher in database systems with a background in software engineering, big data management, and applied machine learning. Specialized in GPU-accelerated stream processing, adaptive query optimization, and high-performance data systems. Seeking engineering roles focused on data processing systems, database systems, or query optimization.

Work Experience

PhD Student and Researcher

BIFOLD / Database Systems and Information Management (DIMA), TU Berlin October 2020–Present

- Built a framework for benchmarking GPU-accelerated stream joins; found throughput differences of up to two orders of magnitude across algorithms and GPUs and derived selection guidelines (EDBT 2024).
- Designed and implemented Kayon, a stream processing prototype that reconfigures concurrent queries across CPU–GPU hardware at runtime, achieving 2.2× baseline throughput with tens of concurrent queries.
- Investigating stream processing on emerging heterogeneous hardware (Apple silicon, NVIDIA BlueField DPUs).

Student Research Assistant

DFKI, Berlin December 2019–September 2020

- Contributed to the development of NebulaStream, a data management system for the Internet of Things (IoT).
- Created a Java client application for query submission.

Machine Learning Engineer (NLP)

RIAK, AI startup, Singapore (Remote) August 2018–December 2018

- Created, trained, and evaluated NLP models that identified essential sections of legal documents, enabling reviewers to focus manual checks on relevant content.

System Analyst

DALA, data management startup, Jakarta January 2018–July 2018

- Translated user requirements into system designs for an oil and gas data management system.

Database Engineer

Dattabot, data management consultancy, Yogyakarta October 2017–December 2017

- Acquired and prepared data for downstream processing through web scraping and data cleansing.
- Supported the data science team in implementing analytical algorithms.

Education

PhD Candidate - Database Systems

Technische Universität Berlin Expected 2026

Research: Adaptive optimization of concurrent stream processing on heterogeneous hardware

Erasmus Mundus Joint Master Degree in Big Data Management and Analytics

Université Libre de Bruxelles; Universitat Politècnica de Catalunya

Technische Universität Berlin September 2018–September 2020

Thesis: *Operator Placement for the IoT*

Bachelor in Computer Science

Universitas Gadjah Mada, Yogyakarta September 2013–August 2017

Bachelor’s thesis: *Road Lane Segmentation Using a Deconvolutional Neural Network*

Technical Skills

Programming: C++, Python, Java, SQL, CUDA

Data Systems and Hardware: Stream processing, adaptive query optimization, contextual multi-armed bandits, heterogeneous CPU–GPU systems, Apple silicon, NVIDIA BlueField DPUs, applied machine learning

Engineering: Testing, profiling, reproducible benchmarking, CI/CD, agentic coding workflows

Languages

Indonesian: Native

Javanese: Native

English: Full professional proficiency (ILR)

German: Limited working proficiency (ILR)

Publications

First-Author Publications

- **D. P. A. Nugroho**, P. M. Grulich, S. Zeuch, C. Lutz, S. Bortoli, and V. Markl. “Benchmarking Stream Join Algorithms on GPUs: A Framework and Its Application to the State of the Art.” *EDBT*, 2024.
- **D. P. A. Nugroho** and M. Riasetiawan. “Road Lane Segmentation Using Deconvolutional Neural Network.” *SCDS*, 2017.

Co-Authored Publications

- M. M. G. Duarte, **D. P. A. Nugroho**, et al. “Mobility Trajectory Data Stream Processing Beyond the Cloud.” *EDBT*, 2026.
- M. M. G. Duarte, **D. P. A. Nugroho**, et al. “Mobility Stream Processing on NebulaStream and MEOS.” *SIGMOD Companion*, 2025.
- M. M. G. Duarte, **D. P. A. Nugroho**, et al. “Mobility Data Stream Processing Beyond the Cloud.” *SIGSPATIAL*, 2025.
- D. Giouroukis, **D. P. A. Nugroho**, V. Pandey, S. Zeuch, and V. Markl. “Analyzing Near-Network Hardware Acceleration with Co-Processing on DPUs.” *PVLDB*, 2025.
- P. M. Grulich, A. P. Lepping, **D. P. A. Nugroho**, V. Pandey, B. Del Monte, S. Zeuch, and V. Markl. “Query Compilation Without Regrets.” *SIGMOD*, 2024.
- F. Schmeller, **D. P. A. Nugroho**, S. Zeuch, and T. Rabl. “Towards a GPU-Accelerated Stream Processing Engine Through Query Compilation.” *LWDA*, 2024.
- P. M. Grulich, A. P. Lepping, **D. P. A. Nugroho**, B. Del Monte, V. Pandey, S. Zeuch, and V. Markl. “Towards Unifying Query Interpretation and Compilation.” *CIDR*, 2023.
- S. Zeuch, X. Chatziliadis, A. Chaudhary, D. Giouroukis, P. M. Grulich, **D. P. A. Nugroho**, et al. “NebulaStream: Data Management for the Internet of Things.” *Datenbank-Spektrum*, 2022.