Paweł Barczyk

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Experience

Wrocław University of Science and Technology Mar 2025 — Jun 2025
Course Instructor *Wrocław*
- Conducted a *Cloud Programming* lab course focused on AWS services and IaC workflows with Terraform.

Cat-astrophe Games Jul 2023 — Aug 2023
Apprenticeship, Software Developer *Wrocław*
- Built Unity tooling to validate asset configuration and streamline persistence workflows for a published game.

Education

Wrocław University of Science and Technology Mar 2024 — Jul 2025
Master Studies — Applied Computer Science, Information Systems Design *Wrocław*
- Graduated with distinction, GPA 5.34.
- Four-time recipient of the first-category Rector's Scholarship for outstanding academic performance (99th percentile).

Wrocław University of Science and Technology Oct 2020 — Jan 2024
Bachelor Studies — Applied Computer Science *Wrocław*
- Graduated with distinction, GPA 5.27.
- Two-time recipient of the first-category Rector's Scholarship for outstanding academic performance (99th percentile).

Extracurriculars

Koło Naukowe Automatyki i Robotyki "Robocik" Nov 2021 — Sep 2025
Science Club Member — Software Team
- Developed Unity simulations for underwater drones; integrated with ML-Agents and ROS2.
- Led and managed a subteam tasked with creating interactive demos and minigames.
- Co-conducted a workshop during *XXVII Lower Silesian Science Festival* on AUV development.
- Set up and maintained internal services: identity/SSO, knowledge base, Git; automated member data sync workflows.

Projects

Human motion analysis planning methodology Sep 2024 — Jun 2025
- Master's thesis component: method for selecting sensing strategy, sensors, and data-processing pipelines.
- Represented domain knowledge as a weighted directed multigraph and provided an algorithm for optimal strategy selection based on user-defined constraints and criteria.
- Verified the method on real-world scenario of monitoring *Wing Chun* martial arts training.

Remote Control IoT System (.NET, Orleans, Blazor, AWS, RabbitMQ) Dec 2022 — Jun 2025
- Developed and iterated on a horizontally scalable IoT system, exploring monolithic and microservice architectures.
- Increased throughput from 8 to 12000 commands per second over the course of development by migrating from relational DB and Django backend to actor-based architecture with .NET Orleans.
- Integrated with AWS IoT Core, SQS and hosted on AWS ECS as one of the iterations.

AI Voice Journal (.NET, Semantic Kernel, Python, Qdrant) Nov 2024 — Jan 2025
- Led a 3-person team building a voice-only, dialogue-based journal with speaker identification, LLM integration, vector search and retrieval-augmented generation.

Skills

- **.NET Ecosystem:** C#, ASP.NET Core, Orleans, Blazor, Semantic Kernel
- **Distributed Systems & Messaging:** Actor Model, RabbitMQ, MQTT, NATS
- **Data Science, ETL & OLAP:** Python, Pandas/Polars, SQL, Cypher, DuckDB
- **Video Game Development:** Unity, Blender, VR/AR
- **Artificial Intelligence:** ML-Agents, LLM integration, Vector Search, RAG
- **Cloud & DevOps:** AWS, TrueNAS, Docker, Terraform, interactive rebase with Git

Publications

- Szlęg, P., Barczyk, P., Maruszczak, B., Zieliński, S., & Szymańska, E. (2023). **Simulation Environment for Underwater Vehicles Testing and Training in Unity3D.** In Intelligent Autonomous Systems 17 (pp. 844–853). https://doi.org/10.1007/978-3-031-22216-0_56.