

Ing. William Brach

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EDUCATION

- **Faculty of Informatics and Information Technologies, STU** Bratislava, Slovakia
Doctoral Degree in Computer Science, Thesis: Context-Aware Web Data Mining 2023 – 2026, May
- **École Polytechnique** Paris, France
Visiting researcher, DaSciM-LIX Jul. 2025 – Aug. 2025
- **University of Southern Denmark (SDU)** Odense, Denmark
Visiting researcher, DSS-IMADA Feb. 2025 – May 2025
- **Faculty of Informatics and Information Technologies, STU** Bratislava, Slovakia
Master's Degree in Computer Science, Thesis: Energy Management in Microgrids 2020 – 2022
- **Faculty of Informatics and Information Technologies, STU** Bratislava, Slovakia
Bachelor's Degree in Computer Science, Thesis: Advanced Testing During Software Development 2016 – 2020

SKILLS SUMMARY

- **Tools:** Python, JavaScript, Bash, Claude Code, Git, Docker, SQL/NoSQL/Vector DBs
- **LLMs & AI:** PyTorch, Hugging Face, DSPy, LangChain, Mistral / OpenAI / Anthropic APIs, RAG, fine-tuning, evaluation harnesses
- **Data & Infra:** Polars, Pandas, Apache Airflow, Spark, FastAPI, Azure/AWS/CGP

WORK EXPERIENCE

- **sommify** Bratislava, Slovakia
Co-Founder October 2022 – June 2026
 - **Beau:** Built and maintained a custom agent harness for wine salespeople and self-service. The core is built with DSPy and supports async tool calls, QA, context compaction, sub-agents, and state management. Deployed as a chat sales assistant that can also modify the customer UI mid-conversation. Includes full-stack FastAPI integration with tests and evaluations.
 - **AI Sommelier:** Set product and technical direction. Designed the recommendation system that turns structured wine, food, and preference data into expert-level pairings, combining custom domain embeddings, retrieval-augmented LLM pairing, and a sommelier-trained evaluation harness that lets a small team iterate on subjective quality without regression.
 - **System and data infrastructure:** Owned the full data and serving stack: Polars + Airflow pipelines (migrated from Databricks/Spark), MS-SQL + MongoDB + Qdrant for relational, document, and vector workloads, and FastAPI services. Automated client catalogue ingestion to onboard new restaurants and retailers without engineering work.
 - **Company building:** Co-led fundraising, hiring, and the strategy that took sommify from research prototype to commercial deployment across Europe and US.
- **ENERGO – AQUA a.s.** Bratislava, Slovakia
Energy Management System Developer Jun 2022 – September 2022
 - **System architecture design:** Contributed to the EMS specification and architecture for cloud deployment on Microsoft Azure: an IoT layer, microservices in AKS, and an integrated ML/AI layer for analytics and optimization.
 - **Data analysis and model development:** Built ML models for photovoltaic (PV) generation forecasting using time-series and deep neural network methods incorporating solar physics variables.
- **S&T Slovakia s.r.o** Bratislava, Slovakia
Microsoft Developer May 2019 – May 2022
 - **SharePoint development:** Full-stack Microsoft developer on custom SharePoint solutions (CSOM for SharePoint Online, SSOM for on-premises). C# / ASP.NET on the backend; ReactJS web parts for SPO and ASP.NET MVC server-side rendering on-prem.
 - **Data import, migration, and Azure cloud services:** Built C# CLI tooling for data import and on-prem ↔ online migration; managed and developed Azure App Services and Functions, with cloud architecture work for scalable deployments.

SELECTED PROJECTS

- **Kluky**: Voice activated AI assistant for community bike-repair workshops. Mechanics with dirty hands use voice to locate tools, get repair guidance, and log completed work into a shared digital logbook that captures the workshop’s collective knowledge. kluky.sk
- **ctxrot**: Context-window observability for DSPy python package. Callback plus a TUI dashboard to inspect agent traces and fight context rot. github.com/williambrach/ctxrot
- **mindloom**: Self-maintaining knowledge wiki inspired by Karpathy’s LLM knowledge-base workflow. CLI that fetches URLs, compiles them into a structured Obsidian vault via Claude Code, and auto-lints cross-links and orphans. github.com/williambrach/mindloom
- **autogradr**: Automatic assignment grader. LLM-driven tool that evaluates student programming submissions against rubrics, used to scale teaching workflows. github.com/williambrach/autogradr

SELECTED PUBLICATIONS

- S Lyngsø Beltoft, **W Brach**, F Torrielli, J Nielsen, A Brok Pirchert, F Tonini, P Schneider-Kamp, LG Poech. “Emergent Languages in Populations of Language Model Agents: From Token Efficiency to Oversight Evasion.” *arXiv:2605.31170*, 2026.
- **W Brach**, F Torrielli, S Lyngsø Beltoft, A Brok Pirchert, P Schneider-Kamp, LG Poech. “The Moltbook Files: A Harmless Slopocalypse or Humanity’s Last Experiment.” *arXiv:2605.07462*, 2026.
- **W Brach**, F Zuppichini, M Vinciguerra, L Padoan. “ScrapeGraphAI-100k: Dataset for Schema-Constrained LLM Generation.” *arXiv:2602.15189*, 2026.
- **W Brach**, T Bedej, J Nielsen, J Pichna, J Bedej, E Saarensilta, J Dupouy, et al. “SommBench: Assessing Sommelier Expertise of Language Models.” *Proc. LREC 2026*, 481–497, ELRA, 2026.
- R Šléher, **W Brach**, K Košťál, LG Poech. “Influence of Prompt Engineering on Small Language Models for Guarded Query Routing.” *Communications in Computer and Information Science*, Springer, 2026.
- **W Brach**, K Košťál, LG Poech. “Chain of Summaries: Summarization Through Iterative Questioning.” *arXiv:2511.15719*, 2025.
- R Šléher, **W Brach**, T Sloboda, K Košťál, L Galke. “Guarded Query Routing for Large Language Models.” *ECAI 2025*, 4129–4136, IOS Press, 2025.
- **W Brach**, K Košťál, M Ries. “The Effectiveness of Large Language Models in Transforming Unstructured Text to Standardized Formats.” *IEEE Access*, 13, 91808–91825, 2025.
- **W Brach**, A Novocký, J Jelínek, K Košťál, M Ries. “LANTNER — Large Language Models for Novel Tasks Annotation in Named Entity Recognition.” *IEEE COINS*, 2025.
- **W Brach**, M Petrik, K Košťál, M Ries. “Ghosts in the Markup: Techniques to Fight Large Language Model-Powered Web Scrapers.” *37th FRUCT*, 37–46, 2025.
- A Kačmár, **W Brach**, M Halinkovič, K Košťál, M Ries. “Augmented Grape Leaf Disease Dataset for Realistic Vineyard Environment using Background Blending.” *International Symposium ELMAR*, 301–305, 2025.
- **W Brach**, K Košťál, M Ries. “Can Large Language Models Detect Plagiarism in Source Code?” *2nd Intl. Conf. on Foundation and Large Language Models*, 370–377, 2024.

HONORS AND AWARDS

- Award for Outstanding Academic Results — November 2025.
- Finalist, Slovak Student Entrepreneur Awards — November 2023.
- Winner, University Technology Incubator of STU — June 2023.
- Best Technical Solution — HackKosice 2023, April 2023.
- Best Master’s Paper, IIT.SRC 2022 — May 2022.
- 2nd Place, HackKosice 2022 / Bloomreach Recommendation Challenge — April 2022.
- 3rd Place, Climathon Bratislava 2021 — October 2021.
- Winner, Boost Startup Journey Accelerator 2021 — August 2021.