

Marcin Lawenda, Ph.D.

Senior Researcher, Supercomputing Department

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PROFILE

Marcin Lawenda is a senior researcher in the Supercomputing Department of the Poznań Supercomputing and Networking Center (PSNC), Poland. He holds an M.Sc. and a Ph.D. in Computing Science from Poznań University of Technology; his early research addressed scheduling and divisible load theory. Over more than two decades at PSNC he has contributed to the design, development and operation of national and European research infrastructures, acting as project coordinator, work-package leader, deputy project manager and quality manager in EU-funded and national projects, including HiDALGO and HiDALGO2. His current research focuses on large-scale environmental simulations, coupled multi-model workflows and digital twins addressing global challenges, on the convergence of high-performance computing, high-performance data analytics and AI, and on sustainable, energy-aware computing infrastructures. He co-organises the AGCA workshop series at PPAM and was awarded a silver medal for long service by the President of the Republic of Poland in 2023.

EDUCATION

Ph.D. in Computing Science (major: Divisible Load Scheduling), Poznań University of Technology, 2006

M.Sc. in Computing Science (major: Parallel and Distributed Computing), Poznań University of Technology, 2000

B.Sc. in Computing Science, Poznań University of Technology, 1998

RESEARCH INTERESTS

High-performance and distributed computing systems; workload scheduling and performance optimisation; energy-aware and sustainable HPC infrastructures; scalability, profiling and benchmarking of large-scale applications; workflow-based and virtual laboratory environments; HPC-HPDA-AI convergence; large-scale environmental simulations and digital twins.

PROJECTS AND ROLES

HiDALGO2 - HPC and Big Data Technologies for Global Challenges (2023-01 to 2026-12)

Principal investigator

MARVEL - Multimodal Extreme Scale Data Analytics for Smart Cities Environments (2021-01 to 2023-12)

Researcher

HiDALGO - HPC and Big Data Technologies for Global Challenges (2018-12 to 2022-02)

Quality manager, work package leader

AMUNATCOLL - AMU Nature Collections (2018-08 to 2021-10)

Technical coordinator

e-IRGSP5 - e-Infrastructure Reflection Group Support Programme 5 (2016-12 to 2018-11)

Work package leader

CoeGSS - Centre of Excellence for Global Systems Science (2015-10 to 2018-09)

Work package leader

DORII - Deployment of Remote Instrumentation Infrastructure (2008-02 to 2010-07)

Work package leader

RINGrid - Remote Instrumentation in Next-Generation Grids (2006-10 to 2008-03)

Deputy of principal investigator

EXPreS - A Production Astronomy e-VLBI Infrastructure (2006-03 to 2009-02)

Researcher

SELECTED PUBLICATIONS

Marcin Lawenda, Łukasz Szustak, László Környei, Flavio Cesar Cunha Galeazzo, Paweł Bratek. Evaluating AMD EPYC CPU architectures on CFD applications. Future Generation Computer Systems, November 2025, ISSN 0167-739X.

<https://doi.org/10.1016/j.future.2025.108237>

Marcin Lawenda, Kyrylo Khloponin, Krzesimir Samborski, Łukasz Szustak. Profiling and Optimization of Multicard

GPU Machine Learning Jobs. Concurrency and Computation: Practice and Experience, July 22, 2025.

<https://doi.org/10.1002/cpe.70196>

Marcin Lawenda, Pawel Wolniewicz. IT Challenges in Designing and Implementing Online Natural History Collection Systems. Diversity 17(6) 388 30 May 2025.

<https://doi.org/10.3390/d17060388>

Marcin Lawenda, Krzesimir Samborski, Kyrylo Khloponin, Łukasz Szustak. Efficient Allocation of Image Recognition and LLM Tasks on Multi-GPU System. Lecture Notes in Computer Science, Springer, vol. 15581, pp 63-78, April 1, 2025.

https://doi.org/10.1007/978-3-031-85703-4_5

Bogdan Jackowiak, Marcin Lawenda. How Does Sharing Data from Research Institutions on Global Biodiversity Information Facility Enhance Its Scientific Value?. Diversity 17(4) 221 22 March 2025.

<https://doi.org/10.3390/d17040221>

Marcin Lawenda, Łukasz Szustak, László Környei. Prediction model of performance-energy trade-off for CFD codes on AMD-based cluster. Future Generation Computer Systems 169(11) 107810 August 2025.

<https://doi.org/10.1016/j.future.2025.107810>

Derek Groen, Nikela Papadopoulou, Petros Anastasiadis, Marcin Lawenda, Lukasz Szustak, Sergiy Gogolenko, Hamid Arabnejad, Alireza Jahani. Large-scale parallelization of Human Migration Simulation. IEEE Transactions on Computational Social Systems, Volume 11, Issue 2, 2135-2146, April 2024.

<https://doi.org/10.1109/TCSS.2023.3292932>

Marcin Lawenda, Jerzy Błoszyk, Szymon Konwerski. Determination of the relativistic value of museum natural collections. Journal of Natural History 57(37-40), 1671-1692, 17 Nov 2023.

<https://doi.org/10.1080/00222933.2023.2272350>

Łukasz Szustak, Marcin Lawenda, Sebastian Arming, Gregor Bankhamer, Christoph Schweimer, Robert Elsaesser. Profiling and optimization of Python-based social sciences applications on HPC systems by means of task and data parallelism. Future Generation Computer Systems, ISSN: 0167-739X 148 623-635 November 2023.

<https://doi.org/10.1016/j.future.2023.07.005>

Bogdan Jackowiak, Marcin Lawenda, Maciej Marcin Nowak, Pawel Wolniewicz, Jerzy Błoszyk, Michał Urbaniak, Piotr Szkudlarz, Damian Jędrasiak, Justyna Wiland-Szymańska, Rafał Bajaczyk, Norbert Meyer. Open Access to the Digital Biodiversity Database: A Comprehensive Functional Model of the Natural History Collections. Diversity 14(8) 596 27 July 2022.

<https://doi.org/10.3390/d14080596>

Complete lists of papers, preprints, reports, white papers and conference contributions:
<https://users.man.poznan.pl/lawenda/>

RESEARCH SOFTWARE

DLT Portal - Inventor, developer, 2024 – present

<https://doi.org/10.5281/zenodo.23299701>

Quare - Principal investigator, 2023 – present

<https://doi.org/10.5281/zenodo.23299540>

Qumasc - Inventor, developer, 2026 – present

<https://qumasc.psnc.pl/>

AMUNATCOLL IT - Technical coordinator, 2018 – 2021

CollMan - Inventor, developer, 2020 – present

CKAN-Zenodo-Exporter - Principal investigator, 2023 – present

<https://doi.org/10.5281/zenodo.23299542>

CKAN2HPC-Client - Principal investigator, 2021 – present

<https://doi.org/10.5281/zenodo.23299544>

ORGANISATION OF CONFERENCES AND WORKSHOPS

PPAM 2026, co-organisation of the conference and the second edition of the Workshop on Advancements of Global Challenges Applications, August 30 - September 2, 2026, Poznań, Poland, held under the honorary patronage of the Minister of Science and Higher Education

PPAM 2024, organisation of the first Workshop on Advancements of Global Challenges Applications, September 8-11, 2024, Ostrava, Czech Republic

VIII Forum BioGIS - System Informacji Przestrzennej w badaniach różnorodności biologicznej, "Transformacja

historycznych danych przyrodniczych do cyfrowych baz danych przestrzennych oraz ich wykorzystanie w nauce, edukacji i ochronie przyrody", Scientific Committee Board Member, November 29, 2023

HiPEAC 2024, organisation of the workshop "Towards reliable Digital Twin - advancing applications and tools capabilities for Global Challenges", January 17-19, 2024, Munich, Germany

HiPEAC 2021, virtual event, organisation of the workshop "Tackling global challenges by the use of HPC / HPDA and AI", January 18-20, 2021

HONOURS AND MEMBERSHIPS

Silver Medal for Long Service, awarded by the President of the Republic of Poland, 13 November 2023

Member: Polish Information Processing Society (since 2000); Big Data Value Association

RESEARCHER IDENTIFIERS

ORCID 0000-0003-4844-3655 | Scopus 8912983400 | Web of Science X-4940-2018 | OpenAlex A5089180719

Google Scholar soJ1bHgAAAAJ | DBLP I/MarcinLawenda | ResearchGate Marcin-Lawenda-2