DAVID GONZÁLEZ-MARTÍNEZ

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SUMMARY

ML researcher focused on the foundations of deep learning and efficient methods, such as model compression.

EDUCATION

- **M.Sc. in Machine Learning**, University of Tübingen (2025–Present)
- **B.Sc. in Computer Science and Software Engineering**, University of Seville (2021–2025)
  Thesis: Model Compression Techniques in Deep Learning, awarded the highest distinction (granted to at most 5% of students). Thesis awarded the NTT DATA best thesis award, given each year to a single bachelor's thesis across all degrees of the School of Computer Engineering (ETSII), University of Seville (Oct 2026).

RESEARCH EXPERIENCE

Research Assistant, WEI Lab
Max Planck Institute for Intelligent Systems, Tübingen, Germany *Dec 2025 – Present*
- Research under the supervision of Prof. Shiwei Liu on deep learning architectures (Depth Memory), efficient in-training low-rank regularization (SLORR), and related topics.

Recipient of a Research Initiation Grant
Universidad de Sevilla, Seville, Spain *Jun 2025 – Aug 2025*
- Conducted research on deep learning model compression under a Research Initiation Grant (€1,250; *Beca de Iniciación a la Investigación*) awarded by the University of Seville.

Independent Researcher
Seville, Spain *Summer 2024 – 2025*
- Conducted independent research with a focus on compression methods for deep neural networks, including quantization, low-rank factorization, and sparsity.
- Began exploring foundational questions in deep learning.

PUBLICATIONS

- **Depth Memory**
  David González-Martínez*, Philipp Nazari*, T. Konstantin Rusch, Shiwei Liu
  arXiv, 2026 · arXiv:2610.18809
- **DepthBench: Measuring How Residual Connections Enable More Computational Depth**
  Keyu Wang*, Yangyi Huang*, Jiale Kang, David González-Martínez, Weiyang Liu, Shiwei Liu
  arXiv, 2026 · arXiv:2609.32534
- **ISO: An RLVR-Native Optimization Stack**
  Hanqing Zhu*, Wenyan Cong*, Zhizhou Sha, Sagnik Mukherjee, Xinyuan Song, David González-Martínez, Xiaoxia Wu, Yuandong Tian, Shiwei Liu, David Z. Pan, Zhangyang Wang
  arXiv, 2026 · arXiv:2607.19331
- **SLORR: Simple and Efficient In-Training Low-Rank Regularization**
  David González-Martínez, Shiwei Liu
  NeurIPS 2026 ODI Workshop · arXiv:2607.08754
- **BALF: Budgeted Activation-Aware Low-Rank Factorization for Fine-Tuning-Free Model Compression**
  David González-Martínez
  TMLR 2026 (released 2025) · arXiv:2509.25136

*Equal contribution.

SELECTED PROJECTS

pequegrad - Toy Deep Learning Framework **github.com/davidgonmar/pequegrad**
- Developed an end-to-end deep learning framework from the ground up, supporting both CPU and GPU. Includes experimental, simulated multi-device support.
- Architected a custom function-tracing system with auto-differentiation support (VJP, experimental JVP, and higher-order derivatives), JIT compilation (including jitable control flow), and experimental automatic device parallelism support.
- Designed a JIT compiler featuring pattern matching and on-the-fly CUDA kernel fusion for reduction, element-wise, and data-movement operations.
- Implemented experimental JAX and ONNX frontends alongside experimental functions for image processing and linear algebra.

OTHER PROFESSIONAL EXPERIENCE

Freelance

Software Engineer *March 2023 to March 2024*

- Designed and implemented a scheduling system tailored to the needs of a sailing school.
- Maintained a strong relationship with this client, leading to a second collaboration in which I created a comprehensive online learning platform. Managed the full stack for both projects, including deployment.
- Supported the development of a new product at an early-stage company, focusing on backend development.
- Enhanced the user experience and maintained the existing UI of an established product.

SKILLS

Programming	Python, TypeScript, C++, CUDA, Java
ML Frameworks	PyTorch, JAX
Languages	English (Professional proficiency), Spanish (Native), Portuguese (Basic)