

Joaquim Campos



Personal data

Location: Lisbon, Portugal

Links:  [Website](#) |  [Email](#) |  [Google Scholar](#) |  [LinkedIn](#) |  [Github](#)

In Brief

I am an engineer specializing in artificial intelligence, signal processing, and Python development. I consult with businesses looking to integrate AI into their operations and offer provide Python development services. Additionally, I provide independent, technology-driven assessments to help companies identify system-wide challenges and implement practical, effective solutions. Previously, I conducted academic research in deep learning, learning theory, and video compression. I also co-founded Radiobooks, a project that leverages AI text-to-speech technology to make more books accessible in audio format.

Highlights:

- Published [seven papers](#) with over 400 citations in top-tier venues, and holds three patents.
- Contributed to the development of [pioneering methods](#) in neural compression.
- Designed [novel algorithms](#) for learning the activation functions of a neural network.
- Created the “[Deep Splines](#)” PyTorch package.
- Co-Founded [Radiobooks](#)—a startup powered by AI text-to-speech technology.
- Built the [back-end](#) of a complex text-to-speech app.

Education

Present Sep 2023	Course in Philosophy and Meditation Tergar Institute , Kathmandu, Nepal Head Teacher: Mingyur Rinpoche. Project: Communicating Emptiness . <i>The course will continue on-site between mid-September and mid-December 2025.</i>
Feb 2020 Sep 2016	MSc in Communication Systems EPFL (École Polytechnique Fédérale de Lausanne), Lausanne, Switzerland School: School of Computer and Communication Sciences . Specialization: Signal processing and artificial intelligence. Master's thesis: Higher-Order Regularization Methods for Supervised Learning . Grade: 5.67/6.00 — Ranking: 2nd/31.
Jul 2016 Sep 2013	BSc in Electrical and Computer Engineering Universidade de Lisboa , Lisbon, Portugal School: Instituto Superior Técnico . Grade: 16.4/20.00.

Work experience

May 2024 Sep 2024	Independent IT Consultant Germano de Sousa , Lisbon, Portugal
	Subject: Independent operations and technology assessment. <ul style="list-style-type: none">• Conducted an independent evaluation to help the company identify challenges and implement effective solutions across diverse areas such as data analytics and project management.• Delivered monthly presentations to top management.• The project concluded with the preparation of a Request for Proposal.
Aug 2022 Jan 2024	Co-Founder and CTO Radiobooks , Lisbon, Portugal
	Subject: Converting books into audiobooks automatically using Artificial Intelligence. <ul style="list-style-type: none">• Designed and built an app for revising AI-generated audio.• Tech stack: Python, FastAPI, MongoDB, Pytest, Docker, GitHub Actions, Codecov, Fly.io, AWS S3, and Better Stack.
Sep 2021 Apr 2020	Research and Teaching Assistant Biomedical Imaging Group , EPFL, Lausanne, Switzerland
	Subject: Supervised Learning with Sparsity-Promoting Regularization. <ul style="list-style-type: none">• Developed a novel framework to learn the activation functions of a neural network;• Designed a spline-based supervised learning method which constructs piecewise-linear models with few regions (sparse).
Aug 2018 Mar 2019	Research Intern Disney Research Studios , Zurich, Switzerland
	Subject: Image and Video Compression using Deep Learning. <ul style="list-style-type: none">• Developed the first content-adaptive neural image compression scheme;• Aided in the construction of a state-of-the-art neural video compression framework.

Teaching experience

Sep 2021 Apr 2020	Teaching Assistant in the Courses Signals and Systems I & II EPFL (École Polytechnique Fédérale de Lausanne), Lausanne, Switzerland
	Taught by Prof. Michael Unser to the Life Sciences and Microengineering sections.
Sep 2021 Apr 2020	Supervision of Master Semester Projects EPFL (École Polytechnique Fédérale de Lausanne), Lausanne, Switzerland
	Co-supervisor of two Master semester projects on lipschitz-constrained GANs .

Skills

Expertise:	Theoretical and practical aspects of machine learning, deep learning, and signal processing; Python development.
DevOps:	Python, C, FastAPI, Pytest, PyTorch, CI/CD, Bash, Linux, MongoDB, Docker, Git, Github Actions, Codecov, AWS, Fly.io, Better Stack.
Languages:	Portuguese, English (professional), Spanish (advanced), French (conversational).

Links to the publications can be found [here](#).

Publications: Science

- [1] A. Goujon, J. Campos, and M. Unser, “Stable parameterization of continuous and piecewise-linear functions,” *Applied and Computational Harmonic Analysis*, vol. 67, p. 101581, Nov. 2023.
- [2] S. Aziznejad, J. Campos, and M. Unser, “Measuring Complexity of Learning Schemes Using Hessian-Schatten Total Variation,” *SIAM Journal on Mathematics of Data Science*, vol. 5, no. 2, pp. 422–445, Jun. 2023.
- [3] J. Campos, S. Aziznejad, and M. Unser, “Learning of Continuous and Piecewise-Linear Functions With Hessian Total-Variation Regularization,” *IEEE Open Journal of Signal Processing*, vol. 3, pp. 36–48, Dec. 2021.
- [4] P. Bohra, J. Campos, H. Gupta, S. Aziznejad, and M. Unser, “Learning Activation Functions in Deep (Spline) Neural Networks,” *IEEE Open Journal of Signal Processing*, vol. 1, pp. 295–309, Nov. 2020.
- [5] S. Aziznejad, H. Gupta, J. Campos, and M. Unser, “Deep Neural Networks With Trainable Activations and Controlled Lipschitz Constant,” *IEEE Transactions on Signal Processing*, vol. 68, pp. 4688–4699, Aug. 2020.
- [6] A. Djelouah, J. Campos, S. Schaub-Meyer, and C. Schroers, “Neural Inter-Frame Compression for Video Coding,” in *Proceedings of the 2019 IEEE/CVF International Conference on Computer Vision (ICCV)*, Oct. 2019.
- [7] J. Campos, S. Meierhans, A. Djelouah, and C. Schroers, “Content Adaptive Optimization for Neural Image Compression,” in *Proceedings of the 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, Jun. 2019.

Publications: Philosophy

- [1] J. Campos, “Mahayana Buddhist Ethics: Deontological, Virtue-Based or Consequentialist? An Optimization Theory Perspective,” Work-in-Progress.
- [2] J. Campos, “On the Wrongness of Killing Non-Human Animals,” Course Thesis, École Polytechnique Fédérale de Lausanne, May 2018.

Patents

- [1] C. Schroers, S. Meierhans, J. Campos, J. Mcphillen, A. Djelouah, E. Varis Doggett, S. Labrozzi, and Y. Xue, “Content Adaptive Optimization for Neural Data Compression,” US Patent 11,057,634, Nov., 2020.
- [2] C. Schroers, J. Campos, A. Djelouah, Y. Xue, E. Varis Doggett, J. Mcphillen, and S. Labrozzi, “Systems and Methods for Reconstructing Frames,” US Patent 10,972,749, Mar., 2021.
- [3] C. Schroers, J. Campos, A. Djelouah, Y. Xue, E. Varis Doggett, J. Mcphillen, and S. Labrozzi, “Systems and Methods for Generating a Latent Space Residual,” US Patent 11,012,718, Mar., 2021.