

Joaquim Campos



Personal data

Location: Lisbon, Portugal

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

In Brief

I am an engineer and researcher specializing in signal processing and artificial intelligence, as well as a Python developer. In academia, my focus has been on deep learning, learning theory, image and video compression, and inverse problems. Additionally, I am Co-Founder of Radiobooks, a startup that assists independent authors and self-learners in automatically converting their books into audio-books using AI. Through this venture, I have gained knowledge in product development and Python DevOps.

Highlights:

- [7 publications](#) with over 300 citations in top-tier venues, and 3 patents.
- Contributed to the development of [pioneering methods](#) in neural compression.
- Crafted [novel algorithms](#) for learning the activation functions of a neural network.
- Created the "[Deep Splines](#)" PyTorch package.
- Co-Founded [Radiobooks](#)—a startup that makes AI text-to-speech technology.
- Built the [back-end](#) of a complex text-to-speech app.

Please note that I will be attending a course in philosophy and meditation at the Tergar Institute in Nepal between mid-September and mid-December in both 2024 and 2025.

Education

Present Sep 2023	<p>Course in Philosophy and Meditation Tergar Institute, Kathmandu, Nepal</p> <p>Head Teacher: Mingyur Rinpoche. Project: Communicating Emptiness. <i>The course will continue on-site between mid-September and mid-December 2024.</i></p>
Feb 2020 Sep 2016	<p>MSc in Communication Systems EPFL (École Polytechnique Fédérale de Lausanne), Lausanne, Switzerland</p> <p>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.</p>
Jul 2016 Sep 2013	<p>BSc in Electrical and Computer Engineering Universidade de Lisboa, Lisbon, Portugal</p> <p>School: Instituto Superior Técnico. Grade: 16.4/20.00.</p>

Work experience

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, Github Actions, Codecov, AWS, Fly.io, Better Stack
Languages:	Portuguese (native), English (professional), Spanish (advanced), French (conversational).
Other skills:	During my academic years, I developed valuable presentation, writing, and teaching skills, much of which I owe to Prof. Michael Unser.

The publications can be consulted [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 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.