Joaquim Campos

Personal data

Place and date of birth:	Lisbon, Portugal, on 10 February 1996
Website:	https://joaquimcampos.com
Email:	joaquimcampos15@duck.com
Google scholar:	https://scholar.google.com/citations?user=GT-VCroAAAAJ
Linkedin:	https://www.linkedin.com/in/joaquim-campos

In Brief

I am an electrical and computer enginner specialized in signal processing and artificial intelligence. Professionally, I have worked on deep learning, learning theory, image and video compression, and inverse problems. I am also interested in other fields such as philosophy, psychology, ethics, and social systems. I enjoy thinking about problems in a holistic manner, drinking from both ancient and modern wisdom, and considering the whole pipeline from philosophical and scientific enquiry to experience and application. I appreciate engaging in healthy discussions, being exposed to different points of view, and—when suitable—communicating the little I know to others.

Education

2016 Jul — Present

MSc in **Applied Buddhist Studies**.
Tergar Institute, Kathmandu, Nepal.
Program on Buddhist philosophy and meditation. Head Teacher: Mingyur Rinpoche. Master's project: *Communicating Madhyamaka Philosophy*.

2020 Feb — 2016 Sep

MSc in **Communication Systems**.
Specialization: **Signals, Images and Interfaces**.
École Polytechnique Fédérale de Lausanne, School of Computer Science and Communication Sciences, Lausanne, Switzerland.
Grade: **5.67/6.00**.
Focus on signal processing and artificial intelligence. Master's thesis: *Higher-Order Regularization Methods for Supervised Learning*.

2016 Jul — 2013 Sep

BSc in **Electrical and Computer Engineering**.
Universidade de Lisboa, *Instituto Superior Técnico*, Lisbon, Portugal.
Grade: **16.4/20.0**

Work experience

2023 Dec 2022 Aug	**Co-Founder and CTO at Radiobooks.** *Converting books into audiobooks automatically using Artificial Intelligence* • Designed and created an app for revising AI-generated audio.
2021 Sep 2020 Apr	**Research and Teaching Assistant** Topic: *Supervised Learning with Sparsity-Promoting Regularization* Biomedical Imaging Group, **École Polytéchnique Fédérale de Lausanne**, Lausanne, Switzerland. Supervisor: **Prof. Michael Unser**. • 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).
2018 Aug 2019 Mar	**Research Intern** Topic: *Image and Video Compression using Deep Learning* **Disney Research**, Zurich, Switzerland. Supervisors: **Dr. Christopher Schoers and Dr. Abdelaziz Djelouah**. • 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

Current 2020 Sep	Teaching assistance in the courses **MICRO-310/11: Signals and Systems I/II** **École Polytéchnique Fédérale de Lausanne**, Lausanne, Switzerland Taught by **Prof. Michael Unser** to the *Life Sciences* and *Microenginneering* sections.
Current 2020 Sep	Supervision of Master semester projects **École Polytéchnique Fédérale de Lausanne**, Lausanne, Switzerland Co-supervisor of two Master semester projects on lipschitz-constrained generative adversarial networks (GANs).

Languages

Mother tongue:	Portuguese
Professional (C1):	English
Advanced (B2):	Spanish
Conversational (B1):	French

Other skills

Primary technical skills:	Knowledge of both theoretical and practical aspects of signal processing, machine learning, and deep learning.
Programming:	C, Python, FastAPI, PyTorch, Bash, Matlab, LaTeX, Backend development and deployment
Other skills:	During my academic years, I developed valuable presentation, writing, and teaching skills, much of which I owe to Prof. Michael Unser.

Publications: Science

[1] 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, 2023.

[2] 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.

[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, Jan. 2022.

[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 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 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."

[2] J. Campos, "On the Wrongness of Killing Non-Human Animals," Course Thesis, École Polytéchnique Fédérale de Lausanne, May 2018.

Patents

[1] C. Schroers, S. Meierhans, J. Campos, J. Mcphillen, A. Djelouah, E. Varis Doggett, S. Labrozzi, and X. Yuanyi, "Content adaptive optimization for neural data compression," US Patent 11 057 634, Jul., 2021.

[2] C. Schroers, J. Campos, A. Djelouah, X. Yuanyi, E. Varis Doggett, J. Mcphillen, and S. Labrozzi, "Systems and methods for reconstructing frames," US Patent 10 972 749, Apr., 2021.

[3] C. Schroers, J. Campos, A. Djelouah, X. Yuanyi, E. Varis Doggett, J. Mcphillen, and S. Labrozzi, "Systems and methods for generating a latent space residual," US Patent 11 012 718, May, 2021.