Zaccharie Ramzi | Al Research Scientist

□ +33 628075699 • 🖂 zramzi@meta.com • Opzaccharieramzi

Researcher specialized in Deep Learning and Computer Vision with excellent Technical Skills and an appetite for Research

Professional experiences

Meta

AI Research Scientist
Research on EMG for neural interfaces

CNRS - ENS

Postdoctoral researcher

- In the team of Gabriel Peyré:
- Research on optimization, implicit models and unrolled models
- Participation in several open source projects, including their respective sprints: benchopt, jaxopt, ott-jax
- Fostering the lab's life: scientific seminars organization, creation of a wiki

CEA & Inria

PhD Student

In the Parietal and Cosmostat teams, my PhD was focused on Deep Learning for MRI reconstruction.

- Designed and implemented new models for MRI reconstruction which allowed me to secure the **2nd spot in the fastMRI 2020 reconstruction challenge** I organized by Facebook and NYU. This was featured in 2 specialized press articles (CEA mag I and Contact I).
- Used the public HPC Jean Zay 🖸 to train neural networks in a distributed fashion with up to 8 nodes totalling 32 GPUs while working on 1Tb of MRI data. Co-created a user's collaborative documentation 🗗.
- Co-founded a lecture group focused on Deep Learning for students at NeuroSpin.
- Analyzed and benchmarked the state-of-the-art in Deep Learning for MRI reconstruction.
- Published 18 papers/abstracts in international peer-reviewed conferences/workshops/journals, among which IEEE TMI and ICLR (spotlight).
- Co-supervised 2 interns, totalling 8 months.
- Peer-reviewed 19 submissions for scientific conferences and journals.

xbird

^o Data scientist

In order to passively monitor diabetes patients, I built data pipelines, read scientific literature, specifically on human activity recognition, designed and implemented ad hoc machine learning models to efficiently detect human activities with smartphone and wearable data (GPS, accelerometer), deployed to production and maintained said models, presented research results to both tech and non-tech teams.

BioSerenity - Brain and Spine Institute

Research intern

Celmatix

[>] Data engineer and data science intern

Ekimetrics

Data science intern

Education

CEA NeuroSpin & Cosmostat - INRIA Saclay Parietal team, PhD

 $^{\circ}$ PhD in deep learning for image reconstruction

Paris Since February 2019

Paris 2022-2023

Paris

2023-

Paris 2019-2022

Berlin

2017-2019

Paris

April–August 2017

New-York

March–September 2016

Paris August 2015–February 2016 The main focus of my thesis is to build an architecture that allows the reconstruction of undersampled MRI data. This led me to work in the fields of compressed sensing, optimization, computer vision, deep learning, and wavelets.

ENS Cachan, MVA Cachan 0 MSc in Mathematics, Vision and Learning, graduated with highest honors 2016-2017 Courses in statistical learning, optimization, graphs, graphical models, reinforcement learning, object recognition, kernel methods, text mining, bandit theory **Telecom ParisTech** 0 Engineering diploma, specialization in machine learning 2013-2017 Courses in mathematical statistics, optimization, relational databases, data mining, data visualization, introduction to machine learning **Technical skills**

- My go-to programming language: Python (TensorFlow, PyTorch, Numpy, Pytest, Hydra, W&B, Jax, ...)
- My typical development environment: VS Code + Git + Jupyter notebooks
- o Programming languages I have used: Java, Scala, Ruby, Javascript, R, Matlab, Shell
- Other tools in my stack: Docker, SLURM, LaTex, Linux, GitHub CI, Travis CI, PyPI
- Open source contributions: coremitools &, TensorFlow &, scikit-image &, jaxopt &, keras-cv &

Open source projects

A selection of the open sources projects I tale part in. All of them are on Github.

fastmri-reproducible-benchmark

0 Deep Learning for MRI reconstruction O fastmri-reproducible-benchmark Using the code in this repo, I secured the 2nd spot in the fastMRI 2020 brain reconstruction challenge.

Benchopt 0

Benchmarking of optimization algorithms **O**benchopt, **O**benchmark resnet classif A meta-benchmarking tools allowing to build benchmarks for optimization algorithms in all application settings.

jaxopt 0

Optimization in jax Hardware accelerated, batchable and differentiable optimizers in JAX.

Miscellaneous

- o I was a private tutor from 2012 until 2015. I helped high school students in maths and physics.
- French is my mother tongue and I speak English at a C1 level (TOEFL: 110). I can speak a bit of conversational German.
- o I was part of a football team for 5 years, mostly during my high school years. In the process we secured the first spot in the second departmental division and got promoted to the first division.
- o I am a huge Coen Brothers and Stanley Kubrick enthusiast. More generally I love cinema, and enjoy a lot watching the web-serie Blow up by ARTE.

Ojaxopt

Paris

Publications

G R, C., **Ramzi, Z.**, Ciuciu, P., "Hybrid learning of Non-Cartesian k-space trajectory and MR image reconstruction networks," Accepted as an oral to ISBI 2022, 2022, [Online]. Available: https://hal.inria.fr/hal-03394881.

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Farrens, S., Grigis, A., El Gueddari, L., **Ramzi, Z.**, G R, C., Starck, S., Sarthou, B., Cherkaoui, H., Ciuciu, P., Starck, J.-L., "PySAP: Python Sparse Data Analysis Package for multidisciplinary image processing," *Astronomy and Computing*, vol. 32, 2020, ISSN: 22131337. DOI: 10.1016/j.ascom.2020.100402. [Online]. Available: https://arxiv.org/abs/1910.08465.

Ramzi, Z., Remy, B., Lanusse, F., Starck, J.-L., Ciuciu, P., "Denoising Score-Matching for Uncertainty Quantification in Inverse Problems," in *NeurIPS 2020 Deep Learning and Inverse Problems workshop*, 2020. arXiv: 2011.08698. [Online]. Available: http://arxiv.org/abs/2011.08698.

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——, "Benchmarking Deep Nets MRI Reconstruction Models on the FastMRI Publicly Available Dataset," in *ISBI 2020 - International Symposium on Biomedical Imaging*, 2020. [Online]. Available: https://hal.inria.fr/hal-02436223.

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Riemenschneider, B., Muckley, M., Radmanesh, A., Kim, S., Jeong, G., Ko, J., Jun, Y., Shin, H., Hwang, D., Mostapha, M., Arberet, S., Nickel, D., **Ramzi, Z.**, Ciuciu, P., Starck, J. L., Teuwen, J., Karkalousos, D., Zhang, C., Sriram, A., Huang, Z., Yakubova, N., Lui, Y. W., Knoll, F., "Results of the 2020 fastMRI Brain Reconstruction Challenge," in *ISMRM*, **Oral**, 2021. arXiv: 1811.08839. [Online]. Available: http://arxiv.org/abs/1811.08839.

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