Romain Vo

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Experience

Ph.D. Student *Saclay, France*
CEA List & Mines Paris *Oct 2021 - Jan 2025*

In a department focused on Non-Destrucive Testing (NDT) for industrial use-cases, my work was focused on building deep learning solutions for 3D Sparse-View X-ray Computed Tomography (CT).

- Building on existing variational optimization methods and advances in 3D graphics, I developed a novel memory-efficient approach for 3D X-Ray CT
- I proposed a convergent Plug-and-Play algorithm for 3D X-ray CT, which outperforms state-of-the-art methods in terms of reconstruction quality.
- Proposed a quantitave benchmark and analysis, under a common implementation, of advanced methods for sparse-view and low-dose X-ray CT.
- Trained deep learning models on HPC resources to solve inverse problems.
- Supervised 2 M.Sc. students on task-oriented reconstruction and the development of a new metric for evaluating the quality of 3D CT reconstructions.
- Peer reviewed 3 papers for a top-tier conference in computer vision (ECCV).

Research Engineer - Computer Vision and Deep Learning *Osny, France*
IDEMIA *May 2021 – Aug 2021*

I worked on biometric fraud detection (antispoofing) using deep learning methods.

- Setup an automatic data creation and acquisition pipeline to create new datasets for training and testing.
- Trained and developed deep learning solutions with interactive demos to showcase the models capabilities.

Research Intern - Computer Vision and Deep Learning *Saclay, France*
CEA List *May 2020 - Nov 2020*

I developed a deep learning algorithm for action detection in egocentric videos.

- Built and interfaced object detection, action recognition and video analysis models to build an end-to-end trainable model.
- Trained the models with HPC cluster on distributed GPUs across multiples nodes (SLURM/PyTorch).

Data Scientist Intern *Rotterdam, Netherlands*
Lely Holding N.V *Jun 2019 - Sept 2019*

Development of an animal health prediction model:

- Collect millions of data points from Azure Data Lake using SQL and Python
- Visualize and build insights from data to identify key features
- Develop a naive bayes classifier resulting in 25pnt % increase in recall and 5pnt % increase in precision.

Education

Mines Paris - PSL University Paris, France
Ph.D. in Applied Mathematics *Oct 2021 – Jan 2025 (Expected)*

My thesis focuses on building novel deep learning algorithms for sparse-view X-ray Computed Tomography (CT). Throughout the PhD, I have worked at the intersections of different fields such as inverse problem, optimization, computer vision, deep learning, variational inference and statistics, and have published in top-tier conferences.

IMT Atlantique (Institut Mines Télécom Atlantique) Nantes, France
Engineering Diploma - Computer Science for Decision Support *Sept 2017 – Sept 2020*

Courses in statistics, data analysis and visualization, optimization, mathematical planning and scheduling, machine learning and agile project management.

NTNU (Norwegian University of Science and Technology) Trondheim, Norway
Erasmus Exchange *Jan 2019 – Jun 2019*

Courses in machine learning, optimization and control, software architecture, and finance for engineering students.

Publications

Learned Proximal Trajectory for 3D Sparse-View X-ray Computed Tomography
Sept 2024
ECCV (Eur. Conf. on Computer Vision)
Romain Vo, Julie Escoda, Caroline Vienne, Étienne Decencière learned-proximal-trajectory

Neural Field Regularization by Denoising for 3D Sparse-View X-ray Computed Tomography
Mars 2024
3DV (Int. Conf. on 3D Vision)
Romain Vo, Julie Escoda, Caroline Vienne, Étienne Decencière 10.1109/3DV62453.2024.00094

Evaluation and Comparison of Two Deep-Learning Strategies for On-Line X-Ray Computed Tomography
Jul 2021
QNDE
Romain Vo, Julie Escoda, Caroline Vienne, Étienne Decencière 10.1115/QNDE2022-98387

Talks & Presentations

Learned Proximal Trajectory for 3D Sparse-View X-ray Computed Tomography
May 2024 - Fontainebleau, France
CMM - Mines paris

Deep Learning and Sparse-View Computed Tomography for Material Science
Jan 2024 - Every, France
Center of Materials - Mines paris

Neural Field Regularization by Denoising for Sparse-View X-ray Computed Tomography
Nov 2023 - Lyon, France
Workshop DIPOpt

Neural Fields for Sparse-View X-ray Computed Tomography
Nov 2023 - Virtual, France
Ulm University Seminar

Neural Fields for Sparse-View X-ray Computed Tomography
Jun 2023 - Toulon, France
ORASIS

Deep Learning Approches for Sparse-View X-ray Computed Tomography
May 2022 - Kaiserslautern, Germany
French-German Workshop

Potentiel des Approches Deep Learning pour la Tomographie RX en ligne
May 2022 - Paris, Germany
Doctoriales COFREND

Teaching

Deep Learning for Image Analysis
Mines Paris

Deep Learning for Image Analysis
PSL University, IASD M.Sc

Computer vision and ML for the material scientist (CVML)
Mines Paris, Mastère DMS

Medical Imaging – X-ray Computed Tomography
Mines Paris, MAREVA

Skills

My development setup: VSCode - Python - Jupyter notebooks - Git

Programming languages I have used: Java, SQL, C++, Matlab, HTML5/CSS3

Tools: Docker/Kubernetes, SLURM, GitLab, Jira, Obsidian

Languages: French (Native), English (Fluent), Spanish (Elementary), Japanese (Elementary)