Rémy Sun

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Professional experience

2023– **Postdoctoral researcher: Integration of knowledge bases into neural networks**, *Université Côte-d'Azur - Institut I3S (CNRS) - Inria Sophia-Antipolis*, Sophia Antipolis, Advisors: Diane Lingrand and Frédéric Précioso.

2023– **Vacataire: Lectures and lab sessions on Deep learning (transformers, LLMs,...) and optimization**, *Université Côte-d'Azur*, Sophia-Antipolis.

2019–2022 **PhD student under a CIFRE scholarship: Content combination strategies for Image Classification**, *Sorbonne University and Thales Land & Air Systems*, Paris, Advised by Matthieu Cord and Nicolas Thome.

2021–2022 **Teaching Assistant for Deep Computer Vision courses**, *Sorbonne University*, Paris.

2015–2019 **"Elève fonctionnaire stagiaire"**, *ENS Rennes*, Bruz.

Cursus

2019–2022 **PhD student under a CIFRE scholarship**, *Sorbonne University and Thales Land & Air Systems*, Paris, Content combination strategies for Image Classification.

2018–2019 **Second year of Master's degree in Mathematics, Computer vision and Statistical learning (MVA)**, *Ecole Normale Supérieure de Paris-Saclay*, Cachan.

2017 **Exchange student at Ecole Polytechnique Fédérale de Lausanne (Second semester)**.

Internships

2019 **Internship: Classification of long term EEGs**, *Conservatoire National des Arts et Métiers*, Paris.
4.5 months internship on Deep learning techniques applied to EEG classification tasks under the supervision of Nicolas Thome

2018 **Internship: Causal analysis of generative neural networks**, *Empirical inference department - Max-Planck Institut for Intelligent Systems*, Tuebingen.
5.5 months internship on the Independence of Cause and Mechanism postulate in generative neural networks under the supervision of Michel Besserve

2017 **Internship: Detecting domain shifts from classifier outputs**, *Computer vision and machine learning group - Institute for Science and Technology (IST) Austria*, Klosterneuberg.
3 months internship on detecting domain shifts impacting classifier performance under the supervision of Christoph Lampert

2016 **Internship: Deep learning and acquiring meaningful latent representations of peptidic sequences**, *Dyliss project - IRISA*, Rennes.
8 weeks exploratory internship on deep learning and peptidic sequences under the supervision of François Coste

Supervision

2023– **Participation to PhD supervision: Kilian Burgi**, *Inria Sophia Antipolis*, Valbonne, Detection and Monitoring of marine biodiversity with artificial intelligence.

2023 **Participation to PhD supervision: Quentin Guimard**, *Inria Sophia Antipolis*, Valbonne, Deep learning pour le streaming adaptatif de vidéos à 360 en réalité virtuelle.

2023– **Supervision of engineer: Li Yang**, *Inria Sophia Antipolis*, Valbonne, Map edition for Autonomous driving research.

2023–2024 **Supervision of master 2 student project: Alice Parodi**, *Inria Sophia Antipolis*, Valbonne, Aggregation techniques for Federated Learning.

2023 **Supervision of master 2 intern: Kenza Roche**, *Inria Sophia Antipolis*, Valbonne, Federated Learning for autonomous driving on a miniature circuit.

2022 **Supervision of master 2 intern: Hugo Malard**, *Thales Land & Air Systems*, Elancourt, Semi-supervised object detection.

Publications

Journals

2024 **Semantic augmentation by mixing contents for semi-supervised learning**, *Pattern Recognition, 2024*, Rémy Sun, Clément Masson, Gilles Hénaff, Nicolas Thome, Matthieu Cord.
Extension of the work presented at the Self-Supervised workshop at NeurIPS 2020

2019 **KS(conf): A Light-Weight Test if a Multi-class Operates Outside of Its Specifications**, *International Journal of Computer Vision (IJCV), 2019*, Rémy Sun, Christoph Lampert, Extension of the work presented at GCPR 2019.

Conferences

2022 **Swapping Semantic Contents for Mixing Images**, *International Conference on Pattern Recognition (ICPR), 2022*, Rémy Sun, Clément Masson, Gilles Hénaff, Nicolas Thome, Matthieu Cord, Oral Presentation.

2021 **MixMo: Mixing Multiple Inputs for Multiple Outputs via Deep Subnetworks**, *International Conference on Computer Vision (ICCV), 2021*, Alexandre Ramé*, Rémy Sun* and Matthieu Cord.

2020 **A theory of independent mechanisms for extrapolation in generative models**, *Association for the Advancement of Artificial Intelligence (AAAI), 2020*, Michel Besserve, Rémy Sun; Dominik Janzing and Bernhard Schölkopf.

2020 **Counterfactuals uncover the modular structure of deep generative models**, *International Conference on Learning Representations (ICLR), 2020*, Michel Besserve, Arash Mehrjou, Rémy Sun and Bernhard Schölkopf.

2018 **KS(conf): A Light-Weight Test if a ConvNet Operates Outside of Its Specifications**, *German Conference on Pattern Recognition (GCPR), October 2018*, Rémy Sun, Christoph Lampert, Oral presentation.

Workshops

2023 **Exploring the Road Graph in Trajectory Forecasting for Autonomous Driving**, *Workshop on on Scene Graphs and Graph Representation Learning (SG2RL) at ICCV, 2023*, Rémy Sun, Diane Lingrand and Frédéric Précioso.
Spotlight

2022 **Adapting Multi-input Multi-output Schemes to Vision Transformers**, *Workshop on Transformers and attention for Vision (T4V) at CVPR, 2022*, Rémy Sun, Clément Masson, Nicolas Thome and Matthieu Cord.

2022 **Towards Efficient Feature Sharing in MIMO Architectures** , *Workshop on Efficient Deep Learning for Computer Vision (ECV) at CVPR, 2022*, Rémy Sun, Alexandre Ramé, Clément Masson, Nicolas Thome and Matthieu Cord.

2020 **Semantic Augmentation with Self-Supervised Content Mixing for Semi-Supervised Learning**, *Workshop on Self-Supervised Learning at NeurIPS, 2020*, Rémy Sun, Clément Masson, Gilles Hénaff, Nicolas Thome and Matthieu Cord.

2019 **Exploiting the modularity of deep networks to generate visual counterfactuals**, *Shared Visual Representations in Human and Machine Intelligence Workshop at NeurIPS, 2019*, Michel Besserve, Arash Mehrjou, Rémy Sun and Bernhard Schölkopf.

2018 **Intrinsic disentanglement: an invariance view for deep generative models**, *Workshop on Theoretical Foundations and Applications of Deep Generative Models at ICML, July 2018*, Michel Besserve, Rémy Sun and Bernhard Schölkopf.

Working papers

2023 **Mind the map! Accounting for existing map information when estimating online HDMaps from sensor data**, *Preprint ArXiv (soumis à CVPR 2024), 2023*, Rémy Sun, Li Yang, Diane Lingrand, Frédéric Précioso.

2022 **Reconciling feature sharing and multiple predictions with MIMO Vision Transformers**, *Preprint Openreview, 2022*, Rémy Sun, Clément Masson, Nicolas Thome, Matthieu Cord.

Responsabilités collectives, administratives

2023-2024 **Reviewer**, *Conférence: Computer Vision and Pattern Recognition (CVPR).*

2023-2024 **Reviewer**, *Journal: Journal of Machine Learning Research (JMLR).*

2022-2023 **Reviewer**, *Journal: Computer Vision and Image Understanding (CVIU).*

2022 **Reviewer**, *Conférence: International Conference on Learning Representations (ICLR).*

Computer science competencies

Languages Python, (O)Caml, C++, C

Machine learning Pytorch, Tensorflow, Scikit-learn , Keras, Pytorch, Theano

Office LaTeX, MS Office

Languages

French Native speaker

English Advanced (C1 level, TOEIC L&R: 980/990)

Chinese (Mandarin) Highschool level

Interests

Litterature Poetry, novels and litterature in general. Particular interest in Camus and writing.

Instruments Piano

Miscellaneous

Transport Driver's license "catégorie B"