

Yann Cabanes

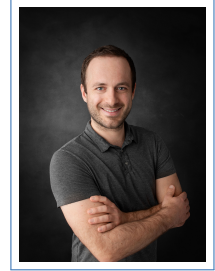
Curriculum Vitae

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Born October 14, 1993 in Vannes, France



Education

- 2017–2022 **PhD CIFRE-Défense with Thales LAS France**, *Institute of Mathematics of Bordeaux*, Bordeaux, France,
Supervised by Marc Arnaudon, Jérémie Bigot and Frédéric Barbaresco.
"Multidimensional complex stationary centered Gaussian autoregressive time series machine learning in Poincaré and Siegel disks: application for audio and radar clutter classification"
- 2016–2017 **Master 2 of Fundamental Mathematics**, *University of Rennes 1*, Rennes, France,
Specialities Geometry and Probabilities.
Mention "Bien"
- 2015–2016 **Master 2 "Agrégation" of Mathematics**, *ENS Rennes*, Rennes, France.
"Agrégation" obtained, ranked 164th over 305 admitted
- 2014–2015 **Master 1 of Fundamental Mathematics**, *University of Rennes 1*, Rennes, France.
Mention "Bien"
- 2013–2014 **Licence 3 of Fundamental Mathematics**, *University of Paris-Saclay*, Orsay, France.
course "Magistère" of Mathematics (additional lessons)
- 2011–2013 **"Classes Préparatoires aux Grandes Ecoles filière MP"**, *Lycée Chateaubriand*, Rennes, France.
- 2010–2011 **Scientifical "baccalauréat" (speciality mathematics)**, *Lycée Victor Hugo*, Hennebont, France.
mention "Bien"

Experiences

- 2022–2024 Post-doctoral fellow at Carleton University, Ottawa, Canada, department of Systems and Computer Engineering
- 2022–2024 Part-time research engineer at the University of Rennes 2 to maintain and develop the open source Python package for time series learning named *tslearn*
- 2020–2024 Collaborator of the open source Python package *geomstats* developing machine learning in Riemannian manifolds
- 2021–2022 Teacher at the IUT of Bordeaux, department GMP (ATER)
- 2021 Teacher at the University of Bordeaux (ATER)

- 2017 Engineer "Etudes Amont" at Thales LAS Limours
Writing of an algorithm simulating the radar behaviour
- 2017 Internship at Thales LAS Limours
Supervised by Frédéric Barbaresco
"The optimisation algorithms CMA-ES and IGO"
- 2014 Internship at the LIMATB of Lorient, France
Supervised by Professor Philippe Le Masson
"Technics of material characterization at high temperatures"

Teachings

- 2021–2022 Teaching mathematics at the IUT of Bordeaux in the department GMP (136 hours)
- 2021 Teaching mathematics at the University of Bordeaux in Licence 1 Biology (64 hours)
- 2021 Teaching mathematics at the University of Bordeaux in Licence 1 Engineer (32 hours)
- 2018–2019 Teaching mathematics at the University of Bordeaux in Licence 1 Biology (32 hours)
- 2017–2019 Teaching mathematics at the University of Bordeaux in Licence 2 Mathematics and Informatics (64 hours)
- 2017–2018 Teaching mathematics at the University of Bordeaux in Licence 2 Mechanics (32 hours)
- 2016–2017 "Colleur" in "Classes Préparatoires aux Grandes Ecoles filières MPSI and MP" (weekly oral exams),
Lycée Chateaubriand de Rennes, France

Awards

- 2016 Laureate of the Lesbesgue Master Scholarship, University of Rennes 1, France
- 2022 Recipient of the "MITACS accelerate" funding (<https://www.mitacs.ca/our-programs/accelerate-core-business/#postdoc>) during my post-doctorate at Carleton University (Ottawa, Canada) for a project in collaboration with CORTAIX (Thales AI research center located in Montreal, Canada). Title of the project: Quantum Machine Learning for Doppler Radar Signal Processing in Clutter

Publications

All publications below are accessible on my personal web page:
<https://ycabanes.perso.math.cnrs.fr/research.html>.

Thesis report

- 2022 Yann Cabanes. Multidimensional complex stationary centered Gaussian autoregressive time series machine learning in Poincaré and Siegel disks: application for audio and radar clutter classification. PhD thesis, tel-03708515, 2022.

Publications as first author in conferences

- 2021 Yann Cabanes and Frank Nielsen. Classification in the Siegel Space for Vectorial Autoregressive Data. GSI 2021.

- 2019 Yann Cabanes, Frédéric Barbaresco, Marc Arnaudon and Jérémie Bigot. Unsupervised Machine Learning for Pathological Radar Clutter Clustering: the P-Mean-Shift Algorithm. C&ESAR 2019, Rennes, France, 19-21 November 2019, hal-02875430
- 2019 Yann Cabanes, Frédéric Barbaresco, Marc Arnaudon and Jérémie Bigot. Non-Supervised High Resolution Doppler Machine Learning for Pathological Radar Clutter. RADAR 2019, Toulon, France, 23-27 September 2019, hal-02875415
- 2019 Yann Cabanes, Frédéric Barbaresco, Marc Arnaudon and Jérémie Bigot. Toeplitz Hermitian Positive Definite Matrix Machine Learning based on Fisher Metric. GSI 2019, Toulouse, France, 27-29 August 2019, hal-02875403
- 2019 Yann Cabanes, Frédéric Barbaresco, Marc Arnaudon and Jérémie Bigot. Non-supervised Machine Learning Algorithms for Radar Clutter High-Resolution Doppler Segmentation and Pathological Clutter Analysis. IRS 2019, Ulm, Germany, 26-28 June 2019, hal-02875365

Other publication as first author on HAL

- 2020 Yann Cabanes, Frédéric Barbaresco, Marc Arnaudon and Jérémie Bigot. Matrix Extension for Pathological Radar Clutter Machine Learning. hal-02875440, 2020.

Publications as secondary author

- 2023 Ankita Dey, Yann Cabanes, Sreeraman Rajan, Bhashyam Balaji, Anthony Damini, Rajkumar Chanchlani. Radar-based Drone Detection using Complex-Valued Convolutional Neural Network. IEEE Sensor Applications Symposium (SAS) 2023, Ottawa, Canada
- 2021 Nina Miolane, Matteo Caorsi, Umberto Lupo, Marius Guerard, Nicolas Guigui, Johan Mathe, Yann Cabanes, Wojciech Reise, Thomas Davies, António Leitão, Somesh Mohapatra, Saiteja Utpala, Shailja Shailja, Gabriele Corso, Guoxi Liu, Federico Iuricich, Andrei Manolache, Mihaela Nistor, Matei Bejan, Armand Mihaï Nicolicioiu, Bogdan-Alexandru Luchian, Mihai-Sorin Stupariu, Florent Michel, Khanh Dao Duc, Bilal Abdulrahman, Maxim Beketov, Elodie Maignant, Zhiyuan Liu, Marek Černý, Martin Bauw, Santiago Velasco-Forero, Jesus Angulo, Yanan Long. ICLR 2021 Challenge for Computational Geometry & Topology: Design and Results, 2021, <https://arxiv.org/abs/2108.09810>.
- 2021 Pierre-Yves Lagrave, Yann Cabanes and Frédéric Barbaresco. $SU(1, 1)$ Equivariant Neural Networks and Application to Robust Toeplitz Hermitian Positive Definite Matrix Classification. GSI 2021.
- 2021 Pierre-Yves Lagrave, Yann Cabanes and Frédéric Barbaresco. An Equivariant Neural Network with Hyperbolic Embedding for Robust Doppler Signal Classification. IRS 2021.
- 2020 Nina Miolane, Alice Le Brigant, Johan Mathe, Benjamin Hou, Nicolas Guigui, Yann Thanwerdas, Stefan Heyder, Olivier Peltre, Niklas Koep, Hadi Zaatiti, Hatem Hajri, Yann Cabanes, Thomas Gerald, Paul Chauchat, Christian Shewmake, Bernhard Kainz, Claire Donnat, Susan Holmes and Xavier Pennec. Geomstats: A Python Package for Riemannian Geometry in Machine Learning. Journal of Machine Learning Research, 2020, <https://www.jmlr.org/papers/volume21/19-027/19-027.pdf>, <https://github.com/geomstats/geomstats>

- 2019 Frédéric Barbaresco, Yann Cabanes. APPROCHER LES DEUX INFINIS PAR LES ONDES ELECTROMAGNETIQUES LES STRUCTURES GEOMETRIQUES ELEMENTAIRES DE L'INFORMATION DIGITALE ELECTROMAGNETIQUE Caractérisation statistique de la mesure digitale des fluctuations spatio-Doppler et polarimétrique de l'onde électromagnétique radar. JS19, 26-27 March 2019, Guyancourt, France. hal-02881612

Computer skills

- Advanced PYTHON, GitHub, \LaTeX
Intermediate MATLAB, Scilab, Linux

Communications

Thesis defense

- 2022 Thesis defense at the Institute of Mathematics of Bordeaux, France

Oral presentations of articles in conferences

- 2021 Conference GSI 2021, Paris, France
2021 Conference SIAM LA21
2019 Conference CE&SAR 2019, Rennes, France
2019 Conference RADAR 2019, Toulon, France
2019 Conference GSI 2019, Toulouse, France
2019 Conference IRS 2019, Ulm, Germany
2019 Conference JS19, Guyancourt, France

Oral presentations in workshops

- 2022 Workshop SONDRRA 2022, Avignon, France
2019 Workshop for Thales Land and Air Systems (LAS) and Thales Defence and Mission Systems (DMS) engineers at TRT Palaiseau, France

Oral presentations in seminars

- 2023 Seminar "Information Geometry and Machine Learning" of the Department of Mathematics and the Department of Applied Mathematics and Statistics at Stony Brook University, New York State, United States
2023 Seminar of the Probabilities and Statistics team of the Mathematics Laboratory of Besançon
2022 Seminar "Riemannian Geometric Statistics" at the Heidelberg Experimental Geometry Lab (<https://hegl.mathi.uni-heidelberg.de/about/>)
2022 Seminar IEEE AESS, Carleton University, Ottawa, Canada
2019 *Colloque Inter'Action 2019*, University of Bordeaux, France

Presentations during educational days

- 2022 Oral presentation for the Thales PhD days at TRT Palaiseau, France
2022 My thesis in 180 seconds for the Thales PhD days at TRT Palaiseau, France
2019 Poster presentation for the Thales PhD days at TRT Palaiseau, France

2019 Poster presentation for the PhD days at the LABRI, Talence, France

— Languages

French Mother tongue
English Fluent
Spanish Intermediate

— Interests

- Tennis
- Surfing
- Sea
- Reading
- Football
- Music
- Mountain
- Family