

Past, present positions and education

- Jan.,2021– **Postdoctoral researcher**, *Mathematics of artificial intelligence*.
Supervisor : Prof. Yaël Frégier, Laboratoire de Mathématiques de Lens, Université d'Artois, France
- June,2021– **Postdoctoral researcher**, Modeling conscious artificial intelligent agents in multi-agent environ-
December,2021 ments using active inference, reinforcement learning and game theory .
Supervisor : Prof. David Rudrauf, Laboratory MMEF, Université de Genève, Switzerland
- Sept.,2016– **PhD in Pure Mathematics**,
May,2021 *Title: Intersection property, interaction decomposition, regionalized optimization and applications*, Algebraic tools in statistics to capture how the brain processes information, machine learning for features learning in intra-cellular structures.
Advisor : Prof. Daniel Bennequin, Departement of Mathematics Université Paris Diderot, France
Jury : Daniel Bennequin, Matilde Marcolli (reviewer), François Gay-Balmaz (reviewer), Grégory Ginot, Frédéric Helein, Paul-André Mellies, Sylvie Paycha, Jean-Pierre Nadal
- Sept.,2014– **Master 2 in Pure Mathematics**,
June,2015 *Université Paris Diderot, Paris 7*.
- Oct.,2013– **Master's in Pure Mathematics : Mathematical Tripos Part III**,
June,2014 *University of Cambridge (DPMMS)*.
- Sept.,2012– **Master 2 in Physics : Fundamental Concepts of Physics -speciality: Theoretical Physics**,
June,2013 *Ecole Normale Supérieure*.
- Sept.,2011– **Master 1 in Physics : Fundamental Concepts of Physics**,
June,2012 *Ecole Normale Supérieure*.
- Sept.,2010– **Bachelor's in Physics : Interuniversity Physics Formation**,
June,2011 *Ecole Normale Supérieure*.
- July,2010 **Admitted as student of the Ecole Normale Supérieure, Paris**.

Teaching experience, total of 320 hours

- Jan.– **Teaching Assistant (ATER) : Statistics**,
May,2020 *Master 1, Université de Paris, France, Prof. K. Tribouley, 64 hours*.
- Jan.– **Teaching Assistant (ATER) : Statistics and probabilistic simulations**,
May,2020 *Licence 3, Université de Paris, France, Prof. S. Gribkova, 64 hours*.
- Sept.– **Teaching Assistant (ATER) : Data analysis**,
Dec.,2019 *Master 1, Université de Paris, France, Prof. C. Levrard, 64 hours*.
- Sept.,2018– **Teaching Assistant (Moniteur): Probability and simulations**,
Jan.,2019 *Licence 1, IUT Paris Descartes (P5), France, Prof. M. Mellouk, 32 hours*.
- Jan.– **Teaching Assistant (Moniteur): Inferential statistics**,
May,2019 *Licence 1, IUT Paris Descartes (P5), France, 32 hours*.
- Jan.– **Teaching Assistant (Contractuel): Analysis on Hilbert Spaces and Fourier analysis**,
May,2017 *Licence 3, Université Paris Diderot (P7), France, Prof. H. Eliasson, 64 hours*.

Publications

- 2022 Grégoire Sergeant-Perthuis. Regionalized optimization. arXiv:2201.11876, 2022.
- 2022 D. Rudrauf, G. Sergeant-Perthuis, O. Belli, Y. Tisserand, and G. Di Marzo Serugendo. Modeling the subjective perspective of consciousness and its role in the control of behaviours. *Journal of Theoretical Biology*, volume 534, page 110957, 2022.
- 2021 Youri Timsit and Grégoire Sergeant-Perthuis. Toward the idea of molecular brain. *International Journal of Molecular Science*, 2021.
- 2021 Youri Timsit, Grégoire Sergeant-Perthuis, and Daniel Bennequin. Evolution of ribosomal protein network architectures. *Scientific Reports*, volume 11. Nature Publishing Group UK, 2021.
- 2021 Grégoire Sergeant-Perthuis. Intersection property and interaction decomposition. arXiv:1904.09017, 2021.
- 2021 Grégoire Sergeant-Perthuis. Interaction decomposition for presheaves. arXiv:2008.09029, 2021.
- 2021 Grégoire Sergeant-Perthuis. Interaction decomposition for Hilbert spaces. arXiv:2107.06444, 2021.
- 2021 Grégoire Sergeant-Perthuis. Bayesian/Graphoid intersection property for factorisation spaces. arXiv:1903.06026, 2021.
- 2021 David Rudrauf, Grégoire Sergeant-Perthuis, Yvain Tisserand, Teerawat Monnor, and Olivier Belli. Combining the Projective Consciousness Model and Virtual Humans to assess ToM capacity in Virtual Reality: a proof-of-concept. arXiv:2104.07053, 2021.
- 2020 Daniel Bennequin, Olivier Peltre, Grégoire Sergeant-Perthuis, and Juan Pablo Vigneaux. Extra-fine sheaves and interaction decompositions. arXiv:2009.12646, 2020.

Talks

- 31 March 2022 **Regionalized optimisation and message passing algorithms**, *Séminaire du Centre de Recherche en Informatique de Lens*, CRIL, Université d'Artois.
- 17 December 2021 **Regionalized optimisation and message passing algorithms**, *Workshop 'Geometrie de Wassertein'*, Laboratoire de Mathematique de Lens, Université d'Artois.
- 17 December 2021 **Active inference with perspective taking**, *Workshop 'Geometrie de Wassertein'*, Laboratoire de Mathematique de Lens, Université d'Artois.
- 21 September 2021 **Modelling consciousness using projective geometry**, *Seminar on consciousness*, LPNC, Université de Grenoble.
- 29 September 2021 **The role of consciousness in social active inference and the emergence of adaptive and maladaptive behaviors**, *Seminario del Istituto di Fisiologia Umana*, Istituto di Fisiologia Umana, University of Palermo.
- 1 October 2021 **The role of consciousness in social active inference and the emergence of adaptive and maladaptive behaviors**, *XXIX CONGRESSO NAZIONALE*, SIPF, Palermo.

Computer skills

PyTorch, Matlab, R, Mathematica

Work Experience

- January 2022–Present **Data Scientist for Cancer detection and classification in medical imaging**, *Median Technologies*, Sophia Antipolis.

Supervision experience

- May-July 2021 Robin Sobczyk, Licence 3 École normale supérieure Paris-Saclay ,
2021 *Title: Active inference for emotional agents within the PCM* , Université de Genève and École normale supérieure Paris-Saclay.
- February-July 2021 Rida Lali, Master 1 École normale supérieure Paris-Saclay,
2021 *Title: Use of heuristics for improving computation times of the Projective Consciousness Model* , Université de Genève and École normale supérieure Paris-Saclay.

Grants

- 2022 **Modélisation du vivant - AAP 2022**, CNRS, 'Architecture of Ribosomal Protein Networks : towards the idea of molecular brains', with Youri Timsit and Daniel Bennequin.
- 2021 **Modélisation du vivant - AAP 2021**, CNRS, 'Architecture of Ribosomal Protein Networks : towards the idea of molecular brains', with Youri Timsit and Daniel Bennequin.