Lionel Voirol

Contact Information

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Education

Ph.D. in Statistics — February 2020 - Present
University of Geneva, Geneva, Switzerland
Thesis advisor: Prof. Stéphane Guerrier

M.Sc. in Business Analytics — 2017 - 2019
University of Geneva, Geneva, Switzerland
Master's overall average: 5.44/6
Thesis: "*Implementing an Analytics Strategy in a SME: A call for Data Quality and Change Management*". Thesis grade: 6/6
Thesis advisor: Prof. Diego Kuonen

B.Sc. in Economics & Management — 2014 - 2017
University of Geneva, Geneva, Switzerland

Diploma of College Studies in Sociology & Administration — 2012 - 2014
CEGEP Ahuntsic, Montreal, Canada

High School Diploma — 2007 - 2012
Collège Regina Assumpta, Montreal, Canada

Academic positions

Ph.D. Candidate and Research & Teaching Assistant — February 2020 - Present
Geneva School of Economics and Management,
University of Geneva, Geneva, Switzerland
Thesis advisor: Prof. Stéphane Guerrier

Visiting Scholar — June 2025
Brookhaven National Laboratory, United States

Visiting Scholar — February 2025 - April 2025
Auburn University, United States
Supervisor: Prof. Roberto Molinari

Teaching Assistant — July 2019 - February 2020
Geneva School of Economics and Management,
University of Geneva, Geneva, Switzerland
Assistant for the Master in Business Analytics

Research Assistant — 2015 - 2016
Faculty of Medicine, UIGP
University of Geneva, Geneva, Switzerland

Research Assistant — 2013
Faculty of Medicine,
University of Montreal, Montreal, Canada

Other professional experiences

Business Analytics Intern 2018 - 2019
UMAN (Finance startup), Geneva, Switzerland

Personal Tutor in Mathematics, Statistics & Econometrics 2016 - 2022
Platform Apprentus & Personal canvassing, Geneva, Switzerland

Principal Cook & Replacement Cook 2014 - 2018
Bull's Pub & Fishermen's Pub, Gland & Nyon, Switzerland

Assistant Muay Thai Coach & Strength and Conditioning Coach 2012 - 2014
APEX Martial Arts, Montreal, Canada

Replacement Cook 2013
La Gascogne, Montreal, Canada

Replacement Cook 2011 - 2013
Fou d'ici, Montreal, Canada

Publications

8. Balbinot, F., **Voirol, L.**, Karemera, M., Feser, R., Gerbase, M., Guerrier S. & Baroffio A., "*Unveiling Empathy Determinants Across Borders: A Comparative Analysis of Medical Students from two geo-sociocultural Backgrounds*", BMC Medical Education, 25, 554, (2025).
doi: https://doi.org/10.1186/s12909-025-07109-7.

7. Karemera, M.*, **Voirol, L.***, Cucci, D. A., Chu, W., Molinari, R. & Guerrier, S., "*Accounting for Vibration Noise in Stochastic Measurement Errors of Inertial Sensors*", IEEE Transactions on Signal Processing 72, (2024).
doi: https://doi.org/10.1109/TSP.2024.3387313.

6. Wehrli, L., Galdadas, I., **Voirol, L.**, Cambet, Y., Guerrier, S., Smiesko, M., Gervasio, F., Nef, S. & Rahban, R., "*The action of physiological and synthetic steroids on the calcium channel CatSper in human sperm*", Frontiers in Cell and Developmental Biology 11, (2023).
doi: https://doi.org/10.3389/fcell.2023.1221578.

5. Cucci, D. A., **Voirol, L.**, Khaghani, M. & Guerrier S., "*On Performance Evaluation of Inertial Navigation Systems: the Case of Stochastic Calibration*", IEEE Transactions on Instrumentation & Measurement 72, (2023).
doi: https://doi.org/10.1109/TIM.2023.3267360.

4. Ramzy, G., Norkin, M., Koessler, T., **Voirol, L.**, Tihy M., McKee, T., Ris, F., Buchs, N., Delucinge-Vivier, C., Docquier, M., Rubbia-Brandt, L., Bakalli, G., Guerrier, S., Huelsken, J. & Nowak-Sliwinska, P., "*Platform combining statistical modeling and patient-derived organoids to facilitate personalized treatment of colorectal cancer*", Journal of Experimental & Clinical Cancer Research 42, 79 (2023).
doi: https://doi.org/10.1186/s13046-023-02650-z.

3. Cucci, D. A.*, **Voirol, L.***, Kermarrec, G., Montillet, J.-P. & Guerrier, S., "*The Generalized Method of Wavelet Moments with eXogenous inputs: a fast approach for the analysis of GNSS position time series*", Journal of Geodesy 97, 14 (2023).
doi: https://doi.org/10.1007/s00190-023-01702-8.

2. Pfarrwaller, E., **Voirol, L.**, Karemera, M., Guerrier, S. & Baroffio, A., "*Dynamics of career intentions in a medical student cohort: a four-year longitudinal study*". BMC Medical Education 23, 131 (2023).
doi: https://doi.org/10.1186/s12909-023-04102-w.

1. Pfarrwaller, E., **Voirol, L.**, Piumatti, G., Karemera, M., Sommer, J., Gerbase, M., Guerrier, S. & Baroffio, A. "*Students' intentions to practice primary care are associated with their motives to become doctors: a longitudinal study*". BMC Medical Education 22, 30 (2022).
doi: https://doi.org/10.1186/s12909-021-03091-y.

* indicates co-first authors and authors are listed alphabetically.

Conference Proceedings

1. **Voirol, L.**, Guerrier, S., Zhang Y., Karemera, M. & Radi A., "*Optimally Weighted Wavelet Variance-based Estimation for Inertial Sensor Stochastic Calibration*", in 12th International Conference on Electrical Engineering, Cairo, Egypt, (2020).
doi: https://doi.org/10.1109/ICEENG45378.2020.9171715.

Working papers (Selected)

7. **Voirol, L.**, Xu, H., Zhang, Y., Insolia, L., Molinari, R. & Guerrier S., "*Towards Open Science for Crustal Deformation Monitoring*". previous version available at https://doi.org/10.48550/arXiv.2409.05160.
6. Zhang, Y., **Voirol, L.**, Emile-Geay, J., & Guerrier, S., "*Uncertainty Quantification of Spectral Estimates in the presence of Uneven Sampling*".
5. Pareek, S., **Voirol, L.**, S. Molinari, R. & Guerrier, S., "*Towards Scalable Gaussian Process Regression with a Moment based Estimation Procedure*".
4. Ramzy, G., **Voirol, L.**, Nowak-Sliwinska, P. & Guerrier, S., "*Adaptive Penalized Regression Models for Personalized Treatment Strategies in Colorectal Carcinoma*".
3. Li, H., Li, Y & **Voirol, L.**, "*`dacc`: An `R` Package for Covariance Estimation and Fingerprinting in Climate Change Detection*".
2. Diana, A., Geoffroy, F., **Voirol, L.**, Audétat, M.-C. & Guerrier, S., "*Identifying and Validating Indicators of Academic Difficulties Among Medical Students: A Statistical Approach*".
1. Loureiro, T., **Voirol, L.** & Guerrier, S. "*Statistical Inference for Spatially Correlated GNSS Signals in Large-Scale Regression Problems*".

Awards

Funding obtained from the Academic Society of Geneva to support a conference presentation at the Joint Statistical Meeting 2023, (granted ammount: 1300 CHF).

Talks

"*Towards Open Science: Computationally Efficient Inference for Large Regression Models with Dependent Errors*", in Data Analytics Lab Workshop 2025, Ovronnaz, Switzerland, (2025).

"*Inference for Large Scale Regression Models with Dependent Errors*", in IMS International Conference on Statistics and Data Science, Nice, France, (2024).

"*The Generalized Method of Wavelet Moments with eXogenous Inputs*", in Data Analytics Lab Workshop 2024, Ovronnaz, Switzerland, (2024).

"*The Generalized Method of Wavelet Moments with eXogenous Inputs*", in Joint Statistical Meeting 2023, Session "Theory and methods for parameter estimation", Toronto, Canada, (2023).

"*The Generalized Method of Wavelet Moments with eXogenous Inputs*", in Data Analytics Lab Workshop 2023, Ovronnaz, Switzerland, (2023).

Teaching Activities

Teaching Materials (Website with interactive materials)

Skaloud, J., Guerrier, S., & **Voirol, L.**"*Inference for Large-Scale Time Series with Application to Sensor Fusion*". More information: https://gmwm.netlify.app/.

Guerrier, S., **Voirol, L.** & Zhang, Y., "*Introduction to Data Science with R*". More information: https://intro-to-ds.netlify.app/.

Guerrier, S., **Voirol, L.** & Zhang, Y., "*Data Analytics for Pharmaceutical Sciences*". More information: https://intro-data-analytics.netlify.app/.

Summary per course as T.A. (University of Geneva)

"Introduction to Statistics"	Spring 2025, 2024 & 2021
"Modelling and Data Analysis for Pharmaceutical Science"	Spring 2025, 2024, 2023 & 2022
"Forecasting with Applications in Business"	Fall 2024 & 2019
"Mathematics I"	Fall 2023
"Introduction to Data Science"	Spring 2023, 2022, 2021 & 2020
"Introduction to Computational Statistics"	Spring 2022
"Business Analytics"	Fall 2020
"Data Quality and Data Collection Strategies"	Fall 2019
"Creating Value Through Data Mining"	Fall 2019

Pedagogical certification

Workshop in University Pedagogy — January 2021
University of Geneva, Switzerland
Teaching and learning support centre (Pôle SEA)
Interactive training combining learning activities, micro-teaching and peer feedback on pedagogical topics such as oral communication, constructive feedback, pedagogical planning, interactive teaching methods and evaluation methods - Equivalent to 45 hours of university training

Teaching Recognition

Educational Innovations at University of Geneva awarded for the project "Web Application" for the class *Introduction to Data Science*, joint work with Guerrier, S. & Yuming, Z. More information here.

Educational Innovations at University of Geneva awarded for the project "Interactive teaching" for the class *Modelling and Data Analysis for Pharmaceutical Science*, joint work with Guerrier, S., Gervasio, F. L., Galdadas, I., Insolia, L. & Yuming, Z. More information here.

Service

Co-organizer of the Data Analytics Lab Workshop 2025, Ovronnaz, Switzerland, (2025).

Co-organizer of the Data Analytics Lab Workshop 2024, Ovronnaz, Switzerland, (2024).

Students Mentoring

Tania Loureiro Ferreira, M.Sc. in Statistics, *"Inference for Dependent Outcomes in Large-Scale Regression Problems with Complex Dependence Structures"*. University of Geneva, 2025.

Thi Huong Quynh Nguyen, M.Sc. in Pharmacy, *"Study of the impact of hormones from the hypothalamic-pituitary-adrenal axis and of testosterone on the regulation of inflammation based on a statistical analysis of biomarkers"*. University of Geneva, 2022.

Youssef Hellioui, M.Sc. in Pharmacy, *"Study of the link between diet and disease based on a statistical analysis of biomarkers"*. University of Geneva, 2021.

Contributions to Statistical Software

1. **"`swaglm`" - `R` package**: Provides a fast implementation of the Sparse Wrapper Algorithm (SWAG) for Generalized Linear Models (GLM). Available on CRAN.
   More information: `https://github.com/SMAC-Group/swaglm`.
2. **"`gmwmx2`" - `R` package**: Implements the Generalized Method of Wavelet Moments with Exogenous Inputs (GMWMX) estimator, offering functions to retrieve Global Navigation Satellite System (GNSS) position time series from the Nevada Geodetic Laboratory and to estimate large regression models with dependent errors and missing data. Available on CRAN.
   More information: `https://github.com/SMAC-Group/gmwmx2`.

3. **"gmwmx" - R package**: Implements the Generalized Method of Wavelet Moments with Exogenous Inputs (GMWMX) estimator and provide functions to estimate time series models that can be expressed as linear models with correlated residuals, such as those used to model Global Navigation Satellite System (GNSS) observations. The package allows for the comparison of estimated parameters obtained with the GMWMX estimator and those obtained with the Maximum Likelihood Estimator implemented in `Hector`. Available on CRAN.
   More information: https://github.com/SMAC-Group/gmwmx.

4. **"navigation" - R package**: Allows the analysis of the impact of sensor error modeling on performance of integrated navigation (sensor fusion) based on IMU, GPS and barometer data. Available on CRAN.
   More information: https://github.com/SMAC-Group/navigation.

5. **"simts" - R package**: Contains various tools for time series analysis. Indeed, this R package provides a series of tools to simulate, plot, estimate, select and forecast different time series models. It is originally conceived as a support to the online textbook "*Applied Time Series Analysis with R*". Available on CRAN.
   More information: https://github.com/SMAC-Group/simts.

6. **"avar" - R package**: Implements the allan variance and allan variance linear regression estimator for time series models. Available on CRAN.
   More information: https://github.com/SMAC-Group/avar.

7. **"idarps" - R package**: Provides datasets and functions for the class "Modelling and Data Analysis for Pharmaceutical Sciences". The datasets can be used to present various methods of data analysis and statistical modeling. Functions for data visualization are also implemented. Available on CRAN.
   More information: https://cran.r-project.org/web/packages/idarps/index.html.

8. **"gmwm" - R package**: Provides a computationally efficient implementation of the estimators introduced in Guerrier et al. (2013).
   More information: https://github.com/SMAC-Group/gmwm.

References

Letter of Recommendation Available upon Request

Prof. Maria-Pia Victoria-Feser, Full Professor of Statistics, Geneva School of Economics and Management, University of Geneva, Switzerland, Maria-Pia.VictoriaFeser@unige.ch.

Prof. Stéphane Guerrier, Assistant Professor of Statistics, Geneva School of Economics and Management, University of Geneva, Switzerland, Stephane.Guerrier@unige.ch.

Prof. Roberto Molinari, Assistant Professor of Statistics,
Auburn University, United States, robmolinari@auburn.edu.

Prof. Diego Kuonen, Adjunct Professor of Statistics, Geneva School of Economics and Management, University of Geneva, Switzerland, Diego.Kuonen@unige.ch.

Community Involvement

Trinity International Residential School — Summer 2012
Construction volunteer
Tirunelveli, India

CLSC de Bordeaux-Cartierville — Summer 2011
Animator for elderly - 90 hours of attested community involvement
Montreal, Canada

Accueil Bonneau — 2010 - 2011
Cook and handy man - More than 120 hours of attested community involvement
Montreal, Canada

Personal skills

Language
French: Mother tongue
English: Fluent

Computer Skills

Extensive experience with `R`, `python`, `bash`, `git`, LaTeX
Good Experience with `C++`, `SQL`, Matlab, PowerBI, FileMaker, Statistica

Competitive sport achievements	Thaï boxing: Competed at a semi-professional and professional level around Europe and did multiple training camps in Thailand. 3rd place at ICO World championship in Stuttgart (2015), winner of the European WFC title in Milan (2016), winner of the WMO professional title in Bangkok (2017), last fight in November 2022 at the Memorial Jorge Martins 16, Martigny, Switzerland (win by decision).
Date	September 19, 2025