Sergio Peignier

Curriculum Vitae

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Education

2014–2017	**Ph.D.**, *INRIA - LIRIS*, Lyon, France. Computer Science.
2013–2014	**M.Sci.**, *ENS*, Lyon, France. Fundamental Computer Science, specialisation in Complex Systems.
2009–2014	**Engineering degree**, *INSA*, Lyon, France. Bioinformatics and Modelling, **Honorable mention**.

Additional Training

2021	**Bayesian Methods for Machine Learning (honorable mention)**, *Higher School of Economics	Coursera*, Moscow, Russia.
2019	**Intensive English Seminar (Erasmus+)**, *Cambridge University*, Cambridge, UK.
2017	**Statical Approaches to Automatic Text Mining**, *University Lumière*, Lyon 2, France.
2015	**History of Sciences**, *University Claude Bernard*, Lyon 1, France.
2015	**Advanced Lecture Course on Computational Systems Biology**, *COMPSYSBIO spring school*, Aussois, France.
2009	**Computer Assambly**, *CECOMP*, La Paz, Bolivia.

Work Experience

2018-Now	**Associate Professor**, *INSA - BF2i*, Lyon, France, Bio-Informatics Department. ○ Gene Regulatory Network Inference based on Ensemble Learning. ○ Gene Regulatory Network Inference based on Classification Algorithms. ○ Computer Vision and Hyper-spectral Image Processing to detect aphids and powdery mildew
2018	**Postdoctoral Research**, *CMLA - ENS*, Cachan, France, MLMDA team, Mathilde Mougeot and Nicolas Vayatis. ○ Project: Industrial data analytics & Machine learning (industrial partners: Atos and CEA). ○ Research on Transfer-Learning methods and their industrial application. ○ Modelling temporal dynamics of diffusion networks.
2017	**Data Scientist**, *Atos Worldline*, Lille, France, High Performance and Volume R&D Team. ○ Deep Learning Methods (LSTM and Autoencoders) for anomaly detection in time-series data. ○ Application to Toro Rosso F1 cars telemetry data for early detection of technical problems.
2014–2017	**Ph.D. Research**, *INRIA - LIRIS*, Lyon, France, BEAGLE team, supervised by Christophe Rigotti and Guillaume Beslon. ○ European project EvoEvo that aims to study evolution and develop bio-inspired algorithms. ○ Evolutionary Subspace Clustering algorithm for dynamic data streams (SubMorphoStream). ○ K-medians Subspace Clustering algorithm for static datasets (KymeroClust). ○ Bio-inspired evolutionary Subspace Clustering algorithm for static datasets (Chameleoclust). ○ Wi-fi signals analyser based on Evolutionary Algorithms (EvoWave). ○ Evolutionary musical companion for dancers (EvoMove).

2016 **Visiting Researcher**, *Faculty of Sciences Universidad Mayor de San Andrés (UMSA)*, La Paz, Bolivia, Collaboration with Heriberto Castañeta Maroni.
- Analysis of high dimensional physical features of chemical compounds using Subspace Clustering.

2014 **M.Sci. Research**, *INRIA - LIRIS*, Lyon, France, BEAGLE team, supervised by Christophe Rigotti and Guillaume Beslon.
- Development of *in silico* models to study the evolution of bacteria genome structure.
- Design of an evolvable Clustering algorithm that adapts to data by changing its genome structure.

2013 **Undergraduate Research**, *LBMC, ENS*, Lyon, France, Genetics of Intra-Species Variations team, Supervised by Gael Yvert.
- Design of computer driven statistical analysis of genetic regions involved in selective advantage of yeast populations under breeding.
- Detection of genetic regions involved in bioethanol manufacturing for Lesaffre company.

2012-2013 **Undergraduate Research**, *Faculty of Sciences Universidad Mayor de San Andrés (UMSA)*, La Paz, Bolivia, Supervised by Heriberto Castañeta.
- Genetic Algorithms and Neural Networks methods for Q-SAR of chemical compounds adsorption.
- Predictive Analysis of RNA secondary structure by Neural Network algorithms.

Awards

2018 **Best Paper Award**, *Information Systems*, International ACM Symposium On Applied Computing, Pau - SAC-2018.

2015 **Best Paper Award**, *Evolutionary Machine Learning*, International ACM conference on Genetic and Evolutionary Computation Conference, Madrid - GECCO-2015.

Publications

Peer-Review Journals

[1] S. Peignier, P. Schmitt, F. Calevro. (2021) Data-Driven Gene Regulatory Network Inference Based on Classification Algorithms. International Journal on Artificial Intelligence Tools

[2] M. Ribeiro Lopes, N. Parisot, K. Gaget, C. Huygens, S. Peignier, et al. (2020) Evolutionary Novelty in the Apoptotic Pathway of Aphids. Proceedings of the National Academy of Sciences of the United States of America (PNAS)

[3] A. Castellini, F. Masillo, M. Bicego, ..., S. Peignier, (2019). Subspace Clustering for Situation Assessment in Aquatic Drones: a Sensitivity Analysis for State-Model Improvement, Cybernetics and Systems, Taylor & Francis

[4] Peignier, S., Zapata, P., (2019) Analysis of Fidel Castro Speeches Enhanced by Data Mining, Digital Humanities Benelux Journal

[5] Peignier, S., Rigotti, C., and Beslon, G. (2018). Evolutionary Subspace Clustering Using Variable Genome Length. Computational Intelligence.

[6] Abernot, J., Beslon, G., Peignier, S. and Rigotti, C. (2017). Evolving Instrument Based on Symbiont-Host Metaphor. Journal of Creative Music Systems

[7] Peignier, S., and Castañeta, H. (2015). Analysis of subspace clustering of molecules using Chameleoclust, an evolutionary algorithm. Revista Boliviana de Química

[8] Peignier, S., and Castañeta, H. (2012). Prediction of Optimal and Suboptimal Secondary Structure of RNA Molecules Using Artificial Intelligence. Revista Boliviana de Química

Books

[1] Peignier S., Zapata P. (2017). Análisis del Discurso Socialista Latinoamericano basado en Inteligencia Artificial [Analysis of Latin-American Socialist Speech Based on Artificial Intelligence]. Instituto Internacional de Integración Convenio Andrés Bello

Conferences

[1] S. Peignier, B. Sorin, F. Calevro. (2021) Gene Regulatory Network using Ensembles of Predictors. IEEE International Conference on Tool with Artificial Intelligence

[2] M. Atiq, S. Peignier, M. Mougeot (2021) Budget Learning Based on Equivalent Trees and Genetic Algorithms. IEEE International Conference on Tool with Artificial Intelligence

[3] N. Debs, S. Peignier, C. Douarre, T. Jourdan et al. (2021) Apprendre l'Apprentissage Automatique: un Retour d'Expérience. Colloque de l'Enseignement des Technologies et des Sciences de l'Information et des Systèmes

[4] S. Peignier, A. Foncelle. (2020) Analyzing Open Data to Support Democracy: a Study Case Inspecting Electoral Fraud in Bolivian General Elections. Digital Humanities BeNeLux Conference

[5] A. Castellini, F. Masillo, M. Bicego, ..., S. Peignier, (2019). Subspace Clustering for Situation Assessment in Aquatic Drones. ACM Symposium on Applied Computing SIGAPP

[6] L. Minvielle, M. Atiq, S. Peignier, M. Mougeot. (2019) Transfer Learning on Decision Tree with Class Imbalance. IEEE International Conference on Tool with Artificial Intelligence

[7] S. Peignier, P. Schmitt, F. Calevro. (2019) Data-Driven Gene Regulatory Network Inference Based on Classification Algorithms. IEEE International Conference on Tool with Artificial Intelligence

[8] S. Peignier, P. Zapata. (2018) What can Reveal 1018 Speeches of Fidel Castro? Digital Humanities BeNeLux Conference

[9] Peignier, S., Rigotti, C., Rossi, A., and Beslon, G. (2018) Weight-based search to find clusters around medians in subspaces. ACM Symposium on Applied Computing Data Mining Track. **Best Paper in Information Systems**

[10] Peignier, S., Rigotti, C., and Beslon, G. (2017) EvoMove: Evolutionary-based living musical companion. European Conference on Artificial Life

[11] Abernot, J., Beslon, G., Peignier, S. and Rigotti, C. (2016) A commensal architecture for evolving living instruments. In Proceedings of the Conference on Computer Simulation of Musical Creativity

[12] Peignier, S., Rigotti, C., and Beslon, G. (2015) Subspace clustering using evolvable genome structure. In Proceedings of the ACM Genetic and Evolutionary Computation Conference. **Best Paper in Evolutionary Machine Learning**

[13] Peignier, S., Rigotti, C., and Beslon, G. (2015) Subspace Clustering for all Seasons. In EvoEvo satellite workshop of the European Conference on Artificial Life

Technical Reports

[1] Peignier, S., (2017) Study of Telemetry Measures for Toro Rosso Formula One Racing Team. Atos Worldline Confidential Technical Report. p.61.

[2] Abernot, J., Beslon, G., Peignier, S. and Rigotti, C. (2016) Deliverable 5.2 EvoEvo project. FP7 funding, http://evoevo.eu/. p.28.

[3] Abernot, J., Beslon, G., Peignier, S. and Rigotti, C. (2016) Deliverable 5.1 EvoEvo project. FP7 funding, http://evoevo.eu/. p.42.

Posters

2021   A. Motes de Oca, A. Kalogeratos, S. Peignier, M. Mougeot. Industrial Data Analytics and Machine Learning - Centre Borelli, Implementation and Tuning of Neural Decision Trees.

2018   L. Minvielle, M. Atiq,S. Peignier, M. Mougeot, N. Vayatis. CMLA - ENS Paris-Saclay, Transfer Learning Summer School, Transfer Learning to Detect Falls.

2018   M. Atiq, L. Minvielle, S. Peignier, M. Mougeot, N. Vayatis. CMLA - ENS Paris-Saclay, Transfer Learning Summer School, Transfer Learning on Equivalent Decision Trees.

2016   S. Peignier, LIRIS, Journée des Thèses du LIRIS (2016): Subspace Clustering Based On Bio-Inspired Evolutionary Algorithm.

Oral Presentations

Invited Talks

2021   V. Lacotte, S. Peignier. BAPOA, Détection de Pucerons par Imagerie Hyperspectrale en Conditions de Laboratoire.

2021   V. Lacotte, S. Peignier. ANR - GreenShield, Élaboration d'une Base de Données Hyperspectrale de Pucerons.

2018   S. Peignier. CMLA - ENS Paris-Saclay, Transfer Learning Summer School, The Biological Way of Transfer.

2017   S. Peignier. Electrical Engineering Department UMSA, La Paz Bolivia: Minería de datos dinámicos y estáticos mediante algoritmos evolutivos de subspace clustering

2017   S. Peignier. Linguistics Department UMSA, La Paz Bolivia: Breve introducción al procesamiento de lenguajes naturales y a la minería de datos basada en inteligencia artificial.

2016   S. Peignier. BeyondLab Math-Info event (Industrial transfer event): EvoEvo (Evolution of Evolution).

Contributed Talks

2017   LIRIS, DM2L Team: Subspace Clustering Using Bio-Inspired Algorithms.

2016   LIRIS, DM2L Team: Subspace Clustering Using Evolvable Genome Structure.

Other Talks

2017   Presentation to IT manager board from Toro Rosso F1 (customer).

2017   Presentation to commercial manager board from Atos Italy (commercial partner).

Open-Source Software

2020   GReNaDIne: Data-Driven Approaches to Infer Gene Regulatory Networks (Python package).

2019   DPD Dendrogram Prototypical Discourse Generator (Python package).

2017   EvoMove Musical Personal Companion (Python).

2017   SubCMedians Subspace Clustering (Python package).

2017   NayesDog RSS reader with Naive Bayes Powered Recommendations (Python).

2016   SubCMedians Subspace Clustering (Knime-Java package).

2016   EvoWave Wifi Context Analysis (Python).

2016   Chameleoclust+ Evolutionary Subspace Clustering (Python package).

Reviewing tasks

2021   Reviewer for Scientific Reports Journal (IF = 4.379)

2021   Reviewer for the Information Sciences Journal - Elsevier (IF = 5.524)

2019   Reviewer for the Digital Humanities BeNeLux Conference.

Teaching Experience

Ph.D. Students Supervision

2021–Now   **Lisa Chabrier**, *Delta-Regulons Inference*, M2, INSA Lyon.

Internship Students Supervision

2021   **Lisa Chabrier**, *Preprocessing Techniques for Arboreto Gene Regulatory Network Inference, Co-advisor with C. Rigotti and A. Crombach*, M2, Sorbonne-Paris.

2020   **Baptiste Sorin**, *Gene Regulatory Network based on Ensemble Learning*, M1, INSA-Lyon.

2020   **Mélanie Sawaryn**, *Text Mining and Automated Graph-Based Summaries*, M1, INSA-Lyon.

2019   **Pauline Schmitt**, *Gene Regulatory Network based on Classification*, M1, INSA-Lyon.

5th Year Bioinformatics and Modelling Dept. (Master 2)

2018–Now   **Stochastic Processes**, INSA, Lyon.

2018–Now   **Projects Supervision**, INSA, Lyon.

4th Year Bioinformatics and Modelling Dept. (Master 1)

2018–Now   **Gene Regulatory Network Inference**, INSA, Lyon.

2020–Now   **String-Searching Algorithms**, INSA, Lyon.

2018–Now   **Artificial Intelligence**, INSA, Lyon.

2018–Now   **Software Development Project**, INSA, Lyon.

2018–2020   **Theoretical Computer Sciences and Graph Theory**, INSA, Lyon.

2018–2020   **Software Deployment (Docker)**, INSA, Lyon.

3th Year Bioinformatics and Modelling Dept. (License 3)

2020–Now   **Introduction to Mathematics (Differential Equations)**, INSA, Lyon.

2020–Now   **Introduction to Computer Sciences (Data-Mining)**, INSA, Lyon.

2018–Now   **Linear Algebra and Matrix Analysis**, INSA, Lyon.

2018–Now   **Data Bases and SQL**, INSA, Lyon.

2014–2016   **Modelling of Biological Systems using MATLAB**, INSA, Lyon.

2014–2016   **Algorithmic and Programming on Python**, INSA, Lyon.

Academic tutoring in mathematics and programming (License 1 and 2)

2012–2014   **Academic Tutoring**, *Passerelle Program*, INSA, Lyon.

Technical skills

OS   Linux, Microsoft Windows, OSX

Programming   Python (scikit-learn, scikit-image, keras, tensorflow, networkx, pandas, numpy, seaborn), C, C++, R, Matlab, Java, LaTeX, html, CSS

Databases   MySQL, SQLite, Neo4J

Language Skills

French (native), **Spanish** (native), **English** (Fluent, TOEIC 2013)
Portuguese (Very good command, B1 2014), **Italian** (Good command, B1 2013)

Extramural Activities

2018   Writing of data science definitions for the Data Analytics Post website (`https://dataanalyticspost.com/`) from the MVA master at ENS Paris-Saclay.

2014   Development of the "Informatique Sensorielle" project for artistic exploration using Neural Networks. Participation in the 4th RADART meeting.