Robin LAMARCHE-PERRIN

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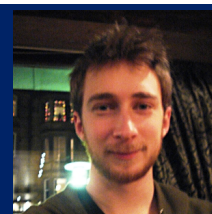
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Color legend Work in **computer science**, in **philosophy of science** and in **quantitative geography**.

POSITIONS

Nov. 2015 – Oct. 2016	**Postdoctoral Researcher in Computer Science** Université Pierre et Marie Curie, Laboratoire d'Informatique de Paris 6 (Équipe « Complex Networks »), Paris.
Nov. 2013 – Oct. 2015	**Postdoctoral Researcher in Computer Science and Applied Mathematics** Max Planck Institute for Mathematics in the Sciences (Research group of Prof. Jürgen Jost), Leipzig.

DISTINCTIONS

Nov. 2014	**Nominated for the Thesis Prize of the University of Grenoble** One of the 2 theses that have been selected by the MSTII Doctoral School among 88 (see [33] below).
Nov. 2013	**Postdoctoral Scholarship from the Max-Planck Society** Two years.
June 2012	**Jury Prize of the Ph.D. Student Day of the Laboratoire d'Informatique de Grenoble** One of the 3 poster presentations that have been selected by the jury among 34 posters (see [25] below).
Oct. 2010	**Doctoral Scholarship from the French Ministry of Higher Education and Research** Three years.

DIPLOMAS

Oct. 2013   **Ph.D. degree in Computer Science**
Université de Grenoble, École Doctorale MSTII, Laboratoire d'Informatique de Grenoble (Équipes MAGMA et MESCAL), Grenoble.
Supervisors: Yves Demazeau and Jean-Marc Vincent
Thesis: Analyse macroscopique des grands systèmes [33]

Sept. 2012   **Master's degree in Philosophy**
Université Pierre-Mendès-France (Groupe de recherche « Philosophie, Langage et Cognition »), Grenoble.
Graduated first (among 45 students) with highest honors (mention « Très Bien »)
Supervisors: Denis Perrin and Max Kistler
M2 Thesis: Des collaborations possibles entre philosophie et intelligence artificielle [34]
M1 Thesis: Le test de Turing pour évaluer les théories de l'esprit [35]

June 2010   **Master's degree in Computer Science**
Université Joseph Fourier, Laboratoire d'Informatique de Grenoble (Équipes MESCAL et MAGMA), Grenoble.
Graduated first (among 17 students) with highest honors (mention « Très Bien »)
Supervisors: Jean-Marc Vincent and Yves Demazeau
Thesis: Observation macroscopique pour l'analyse de SMA à grande échelle [36]

June 2010   **Engineering degree in Computer Science and Applied Mathematics**
Ensimag, Grenoble INP, Grenoble.

June 2009   **Bachelor's degree in Philosophy**
Université Pierre-Mendès-France, Grenoble.

ATTENDANCE TO SUMMER SCHOOLS

June 2015   **Summer School on Dynamics of Multi-level Systems**
Three weeks, MPI PKS, Dresden.

Sept. 2014   **Summer School on Autonomous Learning**
One week, MPI MIS, Leipzig.

July 2014   **Summer School on Spatial Structures and Dynamics**
One week, LabEx DynamiTe, Florence.

July 2012   **CSSS'12: 6th Annual French Complex Systems Summer School**
Two weeks, ISC-PIF, Paris.

July 2011   **EASSS'11: 13th European Agent Systems Summer School**
One week, EURAMAS, Girona.

SCIENTIFIC PROJECTS

- **PEPS JCJC AGRAPH: Agrégation multiéchelle de graphes dynamiques pour l'analyse de processus d'intéraction épistémique (submitted)**
Project leader. (Recently submitted, under reviews, hopefully coming soon!)
Collaborators: Lionel Tabourier, Pierre Latouche, Maud H. Devès, Marion Le Texier and Benjamin Loveluck.

- **FP7-ICT DyM-CS MATHEMACS: Mathematics of Multilevel Anticipatory Complex Systems (2012 – 2015)**
Consortium of six European partners led by the Max Planck Institute for Mathematics in the Sciences , in Leipzig, aiming at developing a mathematical theory of complex multilevel systems and their dynamics. I contributed to **WP1**, dedicated to the identification of relevant scales in complex systems, and to **WP3**, dedicated to the analysis of anticipatory agent-based systems.
Main collaborators: Eckehard Olbrich, Sven Banisch, Kristian Lindgren and Fatihcan Atay.

- **ANR CORPUS GEOMEDIA: Observatoire des flux géomédiatiques internationaux (2013 – 2016)**
Interdisciplinary project of the French National Research Agency (ANR-12-CORP-9) bringing together geographers and media experts from the International College of Territorial Sciences and computer scientists from the Grenoble Informatics Laboratory. My role in this project consists in providing abstraction tools (**WP3**) for the spatial and temporal analysis of international relations through print media (**WP4**).
Main collaborators: Claude Grasland, Benjamin Loveluck, Hugues Pecout, Marta Severo, Timothée Giraud, Jean-Marc Vincent and Yves Demazeau.

- **ANR INFRA SONGS: Simulation Of Next Generation Systems (2012 – 2015)**
Computer science project of the French National Research Agency (ANR-11-INFRA-13) interested in the simulation of large-scale distributed computing platforms. My role in this project consists in providing abstraction tools to tackle and visualise very large execution traces (**WP7**). In particular, it leads to the implementation of an aggregation unit within the open-source VIVA software for traces analysis.
Main collaborators: Jean-Marc Vincent, Lucas M. Schnorr, Damien Dosimont, Guillaume Huard and Arnaud Legrand.

STUDENT PROJECTS

Nov. 2010 – April 2011	**The Déb'ARSH Project: Inter-university Citizenship Project in Grenoble** Documentary projections and debates regarding societal issues. Project founder, organisation of 4 projections and debates.
March 2010 – March 2011	**Philosophy Club for Students of the Université Pierre-Mendès-France** Seminars, debates, presentations of research work for students in philosophy. Project co-founder, organisation of 16 events.

SCIENTIFIC AND ORGANIZING COMMITTEES

July 2016   **GEOMEDIA: International Workshop of the ANR GEOMEDIA Project.** Scientific committee, organising committee, reviewer, session chair.

Sept. 2015   **CS-DC'15: First World e-Conference, organized by the Complex Systems Digital Campus.** Secretary of the "Multi-level Modelling" e-Track.

June 2015   **DYMULT'15: Summer School and Workshop on Dynamics of Multi-level Systems.** Local organisation committee.

April 2015   **RJCIA'15: 13es Rencontres des Jeunes Chercheurs en Intelligence Artificielle.** Scientific committee, reviewer.

Jan. 2015   **R I A : *Revue d'Intelligence Artificielle*, Special Issue on RJCIA'14.** Scientific committee, reviewer.

April 2014   **RJCIA'14: 12es Rencontres des Jeunes Chercheurs en Intelligence Artificielle.** Scientific committee, reviewer.

June 2012   **ASMTA'12: 19th International Conference on Analytic and Stochastic Modelling Techniques and Applications.** Local organisation committee.

SUB-REVIEWING

Nov. 2015   **PLOS ONE**

Nov. 2015   **ICDE'16: 32nd IEEE International Conference on Data Engineering**

June 2013   **SASO'13: 7th IEEE Inter. Conf. on Self-Adaptive and Self-Organizing Systems**

May 2013   **MATES'13: 11th German Conference on Multiagent System Technologies**

March 2013   **JFSMA'13: 21es Journées Francophones sur les Systèmes Multi-Agents**

July 2011   **Tracé 2012/1, No 22: Écologiques. Enquêtes sur les milieux humains**

STUDENT SUPERVISION

May 2016 – July 2016   **Mridul Seth.** Research Internship (11 weeks) at the Laboratoire d'Informatique de Paris 6 « Information-theory for Graph Aggregation »

March 2016 – Sept. 2016   **Hindol Rakshit.** Research Internship (6 months) at the Laboratoire d'Informatique de Paris 6 « An Aggregation Algorithm for Multiscale Analysis of Dynamical Networks »

SOFTWARE

Find links to these projects on my website: `www-complexnetworks.lip6.fr/~lamarche`

My projects

- **Optimal Partition: A toolbox to solve structured versions of the Set Partitioning Problem with decomposable objectives (2013 – in development)**
  This program is a toolbox to solve special versions of the Set Partitioning Problem, that is the combinatorial optimisation of a decomposable objective over a set of feasible partitions (defined according to specific algebraic structures: e.g., hierachies, sets of intervals, graphs). The objectives are mainly based on information theory, in the perspective of multilevel analysis of large-scale datasets, and the algorithms are based on dynamic programming.
  Main collaborators: Yves Demazeau, Jean-Marc Vincent and Damien Dosimont
  License: GNU GPL

- **Multilevel Prediction: Computing information bottleneck measures for prediction efficiency of lumped Markov chains (2015)**
  This program is a toolbox to compute optimal predictors of Markov chains, and in particular multilevel agent-based systems, by using the Information Bottleneck method.
  Main collaborators: Eckehard Olbrich, Sven Banisch and Kristian Lindgren
  License: GNU GPL

Contribution to other projects

- **Geomedia Visualization Tool: A Visualization Tool for Geomediatic Data (2016 – in development)**
  This project aims at providing an open-access application to visualize geographic data and media data that have been collected by the ANR CORPUS GEOMEDIA project. Coming soon!
  Project leader: Density Design Research Lab
  License: GNU GPL

- **Ocelotl Analysis Tool: Multidimensional Overviews for Huge Trace Analysis (2012 – 2015)**
  Ocelotl is an innovative visualization tool, which provides overviews for execution trace analysis by using a data aggregation technique. This technique enables to find anomalies in huge traces containing up to several billions of events, while keeping a fast computation time and providing a simple representation that does not overload the user. It uses a C++ implementation of my aggregation algorithms within the lpaggreg library.
  Project leader: Damien Dosimont
  License: EPL v1.0

- **Viva: Alternative visualization techniques for trace analysis (2012 – 2015)**
  Viva is an open-source tool used to analyze traces (in the Paje File Format) registered during the execution of parallel or distributed applications. The tool also serves as a sandbox to the development of new visualization techniques. Current features include: temporal integration using dynamic time-intervals, spatial aggregation through hierarchical traces, interactive graph visualization with a force-directed algorithm, with viva, and squarified Treemap to compare processes behavior on scale, with vv_treemap.
  Project leader: Lucas M. Schnorr
  License: GNU GPL

PUBLICATIONS
Find links to all papers, preprints and slides on my website:
`https://www-complexnetworks.lip6.fr/~lamarche`

Papers in International Peer-reviewed Journals

[1] **The Information Bottleneck Method for Optimal Prediction of Multilevel Agent-based Systems** (Forthcoming in 2016)
Robin Lamarche-Perrin, Sven Banisch, and Eckehard Olbrich. In *Advances in Complex Systems*. World Scientific, Singapore, 2016.

[2] **L'agenda géomédiatique international : analyse de la distribution spatiale, temporelle et médiatique des flux d'actualité à travers le monde** (Forthcoming in 2016, in French and in English)
Claude Grasland, Robin Lamarche-Perrin, Benjamin Loveluck, and Hugues Pecout. In *L'Espace Géographique*. Éditions Belin, Paris, 2016.

[3] **Building Optimal Macroscopic Representations of Complex Multi-agent Systems. Application to the Spatial and Temporal Analysis of International Relations through News Aggregation**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In N.T. Nguyen, Ryszard Kowalczyk, Juan M. Corchado, and Javier Bajo (eds.), *Transactions on Computational Collective Intelligence*, vol. XV, LNCS 8670, p. 1-27. Springer-Verlag Berlin, Heidelberg, 2014.

Papers in French Peer-reviewed Journals

[4] **Agrégation de traces pour la visualisation de grands systèmes distribués**
Robin Lamarche-Perrin, Lucas M. Schnorr, Jean-Marc Vincent and Yves Demazeau. In Jean-Daniel Fekete and Pierre Dragicevic (eds.), *Visualisation de grandes masses de données*, RSTI série TSI, vol. 33, n°5-6, p. 465-498. Lavoisier, Cachan, 2014*.

[5] **Des collaborations possibles entre Intelligence Artificielle et philosophie de l'esprit**
Robin Lamarche-Perrin. In Anna C. Zielinska (ed.), *Repenser les rapports entre sciences et philosophie*, Recherches sur la philosophie et le langage, vol. 29, p. 47-65. Vrin, Paris, 2014.

Papers in Proceedings of International Peer-reviewed Conferences

[6] **A Generic Algorithmic Framework to Solve Special Versions of the Set Partitioning Problem**
Robin Lamarche-Perrin, Yves Demazeau, and Jean-Marc Vincent. In Andreas Andreou and George A. Papadopoulos (eds.), *Proceedings of the 2014 IEEE International Conference on Tools with Artificial Intelligence (ICTAI'14)*. IEEE Computer Society, November 2014.

[7] **Macroscopic Observation of Large-scale Multi-agent Systems**
Robin Lamarche-Perrin, Yves Demazeau, and Jean-Marc Vincent. In Ricardo Prudencio and Paulo E. Santos (eds.), *Proceedings of the 2014 Brazilian Conference on Intelligent Systems (BRACIS'14)*, p. 121-127. Conference Publishing Services, October 2014.

[8] **A Spatiotemporal Data Aggregation Technique for Performance Analysis of Large-scale Execution Traces**
Damien Dosimont, Robin Lamarche-Perrin, Lucas M. Schnorr, Guillaume Huard, and Jean-Marc Vincent. In Maria S. Perez, Gabriel Antoniu, and Kate Keahey (eds.), *Proceedings of the 2014 IEEE*

International Conference on Cluster Computing (CLUSTER'14), p. 149-157. IEEE Computer Society, September 2014.

[9] **Evaluating Trace Aggregation for Performance Visualization of Large Distributed Systems**
Robin Lamarche-Perrin, Lucas M. Schnorr, Jean-Marc Vincent, and Yves Demazeau. In Tor M. Aamodt and Benjamin C. Lee (eds.), *Proceedings of the 2014 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS'14)*, p. 139-140. IEEE Computer Society, March 2014.

[10] **The Best-partitions Problem: How to Build Meaningful Aggregations**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In Yi Pan and Vijay Raghavan (eds.), *Proceedings of the 2013 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT'13)*, p. 399-404. IEEE Computer Society Press, November 2013.

[11] **Identification of International Media Events by Spatial and Temporal Aggregation of RSS Flows of Newspapers. Application to the Case of the Syrian Civil War between May 2011 and December 2012**
Timothée Giraud, Claude Grasland, Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In *Proceedings of the 18th European Colloquium on Theoretical and Quantitative Geography (ECTQG'13)*, p. 112-114. September 2013.

[12] **How to Build the Best Macroscopic Description of your Multi-agent System?**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In Yves Demazeau and Toru Ishida (eds.), *Proceedings of the 11th International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS'13)*, vol. 7879 of LNCS/LNAI, p. 157-169. Springer-Verlag Berlin, May 2013.

[13] **Analysis of News through Spatial and Temporal Aggregation**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In Yves Demazeau and Toru Ishida (eds.), *Proceedings of the 11th International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS'13)*, vol. 7879 of LNCS/LNAI, p. 296-299. Springer-Verlag Berlin, May 2013.

Papers in Proceedings of French Peer-reviewed Conferences

[14] **Événement international, agenda médiatique et vision du monde : que peuvent nous apprendre les flux RSS des grands médias de presse internationale ?**
Arnaud Brennetot, Timothée Giraud, Claude Grasland, Robin Lamarche-Perrin, Hélène Mathian, Christine Plumejeaud, Sophie de Ruffray, and Marta Severo. In *Proceedings of the 2014 Conference of the International College of Territorial Sciences (CIST): "Frontiers and boundaries of territorial sciences"*, p. 60-70, Paris, France, March 2014.

[15] **Organisation, agrégation et visualisation d'informations médiatiques**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In *Proceedings of the 2011 Conference of the International College of Territorial Sciences (CIST): "Fonder les sciences du territoire"*, p. 240-246, Paris, France, Nov. 2011.

[16] **Observation macroscopique et émergence dans les SMA de très grande taille**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In Emmanuel Adam and Jean-Paul Sansonnet (eds.), *Actes des 19es Journées Francophones des Systèmes Multi-Agents (JFSMA'11)*, p. 53-62, Valenciennes, France, Oct. 2011.

[17] **Conceptualisation de l'émergence : dynamiques microscopiques et analyse macroscopique des SMA**

Robin Lamarche-Perrin. In *Plateforme AFIA 2011 : Atelier Futur des Agents et des Multi-Agents (FUTURAMA'11)*, Chambéry, France, May 2011.

Communications in Peer-reviewed Conferences (without Proceedings)

[18] **The Information Bottleneck Method for Optimal Prediction of the Voter Model**
Robin Lamarche-Perrin, Sven Banisch, and Eckehard Olbrich. In *the 2015 Conference on Complex Systems (CCS'15)*, Sept.-Oct. 2015.

[19] **Evaluating Multilevel Predictions from Data – The Case of Trading Data to Predict GDP Growth**
Sven Banisch, Robin Lamarche-Perrin, and Eckehard Olbrich. In *the 2015 Conference on Complex Systems (CCS'15)*, Sept.-Oct. 2015.

[20] **La médiatisation des catastrophes : l'exemple des tremblements de terre et des tsunamis**
(slides)
Claude Grasland, Robin Lamarche-Perrin, Vega Partesotti and Marta Severo. In *the Annual seminar of the International College of Territorial Sciences (CIST) : "Territoires en action"*, Nov. 2012.

[21] **Des collaborations possibles entre Intelligence Artificielle et philosophie de l'esprit**
Robin Lamarche-Perrin. In *the 3rd young researchers conference of the Philosophie, Langages & Cognition (PLC) research group : « Repenser les rapports entre science(s) et philosophie »*, June 2011.

Posters and Videos in Peer-reviewed Conferences (without Proceedings)

[22] **The Information Bottleneck Method for Optimal Prediction of Multilevel Agent-based Systems**
Robin Lamarche-Perrin, Sven Banisch, and Eckehard Olbrich. Poster Sessions of *the 2015 Summer School and Workshop on Dynamics of Multilevel Systems (DYMULT'15)*. Max Planck Institute for the Physics of Complex Systems, June 2015.

[23] **Multi-resolution Representations of Media Information**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In *Video Competition of the 23rd International Joint Conference on Artificial Intelligence (IJCAI'13)*, Beijing, China, August 2013.

[24] **Informational Measures of Aggregation for Complex Systems Analysis**
Robin Lamarche-Perrin, Jean-Marc Vincent and Yves Demazeau. In *Poster Session of the 2012 European Conference on Complex Systems (ECCS'12)*, Brussels, Belgium, Sept. 2012.

[25] **Informational-Theoretic Measures of Aggregation for the Analysis of Complex Systems**
Robin Lamarche-Perrin, Yves Demazeau and Jean-Marc Vincent. In *Journée des doctorants du Laboratoire d'Informatique de Grenoble (LIG)*, Grenoble, France, June 2012.

Deliverables of the ANR CORPUS GEOMEDIA Project

[26] **Studying media events through spatio-temporal statistical analysis**
Angelika Studeny, Robin Lamarche-Perrin, and Jean-Marc Vincent. Technical Report Deliverable L.3.2, Project ANR CORPUS GEOMEDIA, June 2015.

[27] **Multidimensional Aggregation of RSS Flows**
Robin Lamarche-Perrin, Yves Demazeau, Jean-Marc Vincent, Timothée Giraud, and Claude Grasland. Technical Report Deliverable L.3.1, Project ANR CORPUS GEOMEDIA, June 2015.

Deliverables of the FP7-ICT MatheMACS Project

[28] **Application and validation of developed information theoretical methodologies**
Kristian Lindgren, Eckehard Olbrich, Sven Banisch, and Robin Lamarche-Perrin. Technical Report Deliverable 1.3, Project FP7-ICT MatheMACS, September 2015.

[29] **A unified theory of interacting anticipatory agents**
Eckehard Olbrich, Sven Banisch, Robin Lamarche-Perrin, and Kristian Lindgren. Technical Report Deliverable 3.4, Project FP7-ICT MatheMACS, September 2015.

[30] **Identification of anticipatory levels**
Eckehard Olbrich and Robin Lamarche-Perrin. Technical Report Deliverable 3.2, Project FP7-ICT MatheMACS, September 2014.

Scientific Popularization

[31] **La machine à anticiper le monde**
Clément Delorme. *Les Dossiers de la Recherche*, vol. 10, p. 18-21. Sophia Publications, June/July 2014.

[32] **Intelligence artificielle et philosophie, deux cousines éloignées**
Martine Brilleaud and Robin Lamarche-Perrin. *Mathématiques & informatique*, Tangente, Hors-série 52, p. 20-24. Éditions Pole, June 2014.

Theses

[33] **Analyse macroscopique des grands systèmes. Émergence épistémique et agrégation spatio-temporelle**
Robin Lamarche-Perrin. Ph.D. Thesis in Computer Science, supv. Yves Demazeau and Jean-Marc Vincent, Université de Grenoble, France, Oct. 2013.

[34] **Des collaborations possibles entre philosophie et Intelligence Artificielle**
Robin Lamarche-Perrin. Master Thesis in Philosophy, supv. Denis Perrin, Université Pierre-Mendès-France, Grenoble, France, Sept. 2012.

[35] **Le Test de Turing pour évaluer les theories de l'esprit**
Robin Lamarche-Perrin. Master Thesis in Philosophy, supv. Max Kistler, Université Pierre-Mendès-France, Grenoble, France, Sept. 2010.

[36] **Observation macroscopique pour l'analyse de systèmes multi-agents de très grande taille**
Robin Lamarche-Perrin. Master Thesis in Computer Science, supv. Jean-Marc Vincent and Yves Demazeau, Université Joseph Fourier, Grenoble, France, June 2010.