

Rémi EYRAUD, PhD

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Current Situation

Maître de Conférences, HDR (Associate Professor, tenure) at the Jean Monnet University

Member of the Laboratoire Hubert Curien, Data Intelligence Team

Academic Degrees

Habilitation à Diriger des Recherches

“Grammatical Inference: learning computational models from various types of structured data”, *Aix-Marseille University*, 2019.

Jury composition:

Pr. Cécile CAPPONI, Aix-Marseille University, Member

Pr. François DENIS, Aix-Marseille University, President

Pr. Makoto KANASAWA, Hosei University, Member

Pr. Jacques NICOLAS, INRIA-IRISA, Reviewer

Pr. Marc SEBBAN, University of Saint-Etienne, Reviewer

Pr. Marc TOMMASI, University of Lille, Reviewer

Doctoral Dissertation (PhD)

“Grammatical Inference of Context-Free Languages”, *University Jean Monnet of Saint-Étienne*, 2006.

Jury composition:

Dr. Alexander CLARK, Royal Holloway University of London, Member

Pr. Antoine CORNUÉJOLS, AgroParisTech, President

Pr. Colin DE LA HIGUERA, University of Nantes, Director

Pr. Jean-Christophe JANODET, University of Evry, Co-director

Pr. Géraud Sénizergues, University of Bordeaux, reviewer

Pr. Isabelle Tellier, University of Sorbonne Nouvelle, reviewer

Pr. Takashi Yokomori, Waseda University of Tokyo, member

MSc. in Computer Science

Ecole Nationale des Mines de Saint-Etienne, 2003. Concentration: multi-agent systems, machine learning, grammatical inference. Final thesis: “Learning automata with a splitting-state process”. First year thesis (TER): “Simulations of social networks using cellular automata”.

Licence in Computer Science

University Jean-Monnet, Saint-Etienne, 2001. Major in Computer Science, minor in Mathematics.

Career

December 2020 – : Maitre de conférences, Université Jean Monnet – IUT of Saint-Etienne, LabHC UMR CNRS 5516

September 2007 – November 2020: Maitre de conférences, Aix-Marseille University, LIS UMR CNRS 7020

July 2014 – December 2014: Invited Researcher at the Delaware University, USA

July 2012 – December 2013: Invited Researcher at the University of Maryland, Baltimore County, USA

January 2007 – September 2007: Non-permanent Researcher at the University of Amsterdam, The Netherlands

September 2006 – January 2007: Non-permanent full-time Lecturer (ATER) at University of Saint-Étienne, France

September 2003 – August 2006: Ministry of Research founded PhD program with teaching duties (Allocataire-Moniteur)

List of Publications

All publications can be found [here](#).

Though of few interest – and presenting a clear threat to science –, some rankings are given to the articles in journal due to the fact that some are reducing research impact to these metrics.

Book Chapter

"Efficiency in the identification in the limit paradigm", Rémi EYRAUD, Jeffrey HEINZ, Ryo YOSHINAKA, in *Topics in Grammatical Inference*, Springer, 2016

International Journals:

- o "Distillation of Weighted Automata from Recurrent Neural Networks using a Spectral Approach", Rémi EYRAUD, Stéphane AYACHE, *Machine Learning Journal*, 2021.
IF: 2.73; H-index: 135; SRJ: 0.71; Citescore: 2.78; SNIP: 1.743; Core: A.
- o "An AI-powered blood test to detect cancer using nanoDSF", Philipp O. TSVETKOV, Rémi EYRAUD, Stéphane AYACHE, Anton A. BOUGAEV, Soazig MALESINSKI, Hamed BENAZHA, Svetlana GOROKHOVA, Christophe BUFFAT, Caroline DEHAIS, Marc SANSON, Franck BIELLE, Dominique FIGARELLA BRANGER, Olivier CHINOT, Emeline TABOURET, and François DEVRED, *Cancers*, 2021.
IF: 6.433; H-index: 64; SRJ: 1.94; Citescore: 5.87; SNIP: 4.07
- o "Designing and Learning Substitutable Plane Graph Grammars", Rémi EYRAUD, Jean-Christophe JANODET, Tim OATES, Frédéric PAPADOPOULOS, *Fundamenta Informaticae*, 2016.
IF: 1.47; H-index: 63; SRJ: 0.332; Citescore: 1.28; SNIP: 0.821; Core: B.
- o "Learning Strictly Local Subsequential Functions", Jane CHANDLEE, Rémi EYRAUD, Jeffrey HEINZ, *Transactions of the Association for Computational Linguistics*, 2014.
IF: 2.90; H-index: 85; SRJ: 0.455; Citescore: 3.44; SNIP: 3.793; Core: A*.

- o "PAutomaC: a probabilistic automata and hidden Markov models learning competition", Sicco VERWER, Rémi EYRAUD, Colin DE LA HIGUERA, *Machine Learning Journal*, 2014. IF: 2.73; H-index: 135; SRJ: 0.71; Citescore: 2.78; SNIP: 1.743; Core: A.
- o "Using Contextual Representations to Efficiently Learn Context-Free Languages", Alexander CLARK, Rémi EYRAUD, Amaury HABRARD, *Journal of Machine Learning Research*, 2010. IF: 5.31; H-index: 173; SRJ: 1.426; Citescore: 4.76; SNIP: 2.454; Core: A*.
- o "Polynomial Identification of Substitutable Context-Free Languages", Alexander CLARK, Rémi EYRAUD, *Journal of Machine Learning Research*, 2007. IF:5.31; H-index: 173; SRJ: 1.426; Citescore: 4.76; SNIP: 2.454; Core: A*.
- o "LARS : a Learning Algorithm for Rewriting Systems", Rémi EYRAUD, Colin DE LA HIGUERA, Jean-Christophe JANODET, *Machine Learning Journal*, Springer, 2007. IF: 2.73; H-index: 135; SRJ: 0.71; Citescore: 2.78; SNIP: 1.743; Core: A.

Peer-Reviewed International Conferences:

- o "Learning with Partially Ordered Representations", Jane CHANDLEE, Remi EYRAUD, Jeffrey HEINZ, Adam JARDINE, and Jonathan RAWSKI, proceedings of the 16th Meeting on the *Mathematics of Language*, Association for Computational Linguistics, 2019
- o "Explaining Black Boxes on Sequential Data using Weighted Automata", Stéphane AYACHE, Rémi EYRAUD, and Noé GOUDIAN, proceedings of the 14th *International Conference on Grammatical Inference*, PMLR, vol. 93, 2018
- o "Sp2Learn: A Toolbox for the spectral learning of weighted automata", Denis ARRIVAUULT, Dominique BENIELLI, François DENIS and Rémi EYRAUD, proceedings of the 13th *International Conference on Grammatical Inference*, PMLR, vol. 57, 2016
- o "Results of the Sequence Prediction Challenge (SPiCe): a Competition on Learning the Next Symbol in a Sequence ", Borja BALLE, Rémi EYRAUD, Franco M. LUQUE, Ariadna QUATTONI, Sicco VERWER, proceedings of the 11th *International Conference on Grammatical Inference*, PMLR, vol. 57, 2016
- o "Output Strictly Local Functions", Jane CHANDLEE, Rémi EYRAUD, Jeffrey HEINZ, proceedings of the 14th Meeting on the *Mathematics of Language*, Association for Computational Linguistics, 2015
- o "Very efficient learning of structured classes of subsequential functions from positive data", Adam JARDINE, Jane CHANDLEE, Rémi EYRAUD, Jeffrey HEINZ , proceedings of the 12th *International Conference on Grammatical Inference*, PMLR, vol. 34, 2014
- o "Learning Substitutable Binary Plane Graph Grammars", Rémi EYRAUD, Jean-Christophe JANODET, Tim OATES, proceedings of the 11th *International Conference on Grammatical Inference*, PMLR, vol. 21, 2012
- o "Results of the PAutomaC Probabilistic Automaton Learning Competition ", Sicco VERWER, Rémi EYRAUD, Colin DE LA HIGUERA, proceedings of the 11th *International Conference on Grammatical Inference*, PMLR, vol. 21, 2012.
- o "A Polynomial Algorithm for the Inference of Context-Free Languages", Alexander CLARK, Rémi EYRAUD, Amaury HABRARD, proceedings of the 9th *International Colloquium on Grammatical Inference*, LNAI 5278, Springer, 2008
- o "Learning Auxiliary Fronting with Grammatical Inference", Alexander CLARK, Rémi EYRAUD, proceedings of the 10th Conference on *Computational Natural Language Learning*, 2006

- o "Identification in the Limit of Substitutable Context-Free Languages", Alexander CLARK, Rémi EYRAUD, proceedings of the 16th International Conference on *Algorithmic Learning Theory*, LNAI 3734, Springer, 2005
- o "Representing Languages by Learnable Rewriting Systems", Rémi EYRAUD, Colin DE LA HIGUERA, Jean-Christophe JANODET, proceedings of the 7th *International Colloquium on Grammatical Inference*, LNAI 3264, Springer, 2004

National conferences, short papers, posters, workshops:

- o "Scikit-SpLearn: A Toolbox for the spectral learning of weighted automata compatible with scikit-learn", Denis ARRIVAUULT, Dominique BENIELLI, François DENIS and Rémi EYRAUD, proceedings of the *Conference francophone en Apprentissage* (French Machine Learning Conference), 2017
- o "New Polynomial Bounds for the Identification in the Limit Paradigm using Generative Grammars", Rémi EYRAUD, Jeffrey HEINZ, *ICALP Satellite Workshop on Learning Theory and Complexity*, 2013, Riga, Latvia.
- o "A note on contextual binary feature grammars", Alexander CLARK, Rémi EYRAUD, Amaury HABRARD, *EACL 2009 workshop on Computational Linguistic Aspects of Grammatical Inference*, Athens, Greece, 2009.
- o "Spring School in Machine Learning. Teaching experiences", Cécile CAPPONI, François DENIS, Rémi EYRAUD, Amaury HABRARD, Liva RALAIVOLA, *PASCAL Workshop: Teaching Machine Learning*, Saint-Etienne, France, 2008.
- o "Two methods to learn context-free languages", Rémi EYRAUD, *workshop ML4NLP*, Amsterdam, 2007.
- o "Learning Auxiliary Fronting with Grammatical Inference", Alexander CLARK, Rémi EYRAUD, proceedings of the 28th Annual Conference of the *Cognitive Science Society*, Vancouver, Canada, 2006.
- o "Deux Techniques d'Apprentissage de Langages Hors-Contextes", Rémi EYRAUD, proceedings of the 8th *Conférence francophone d'Apprentissage Automatique*, Trégastel, France, 2006.

Scientific Activities

Principal collaborations

- Alexander Clark, King's College, London, UK (7 co-authored papers, long visit)
- Jeffrey Heinz, Stony Brook University, USA (6 co-authored papers, long and short stays)
- Colin de la Higuera, Nantes University, France (4 co-authored papers, co-organised events)
- Jean-Christophe Janodet, Evry University, France (4 co-authored papers)
- Sicco Verwer, Delft University, The Netherlands (3 co-authored papers, co-organised international challenges)
- Jane Chandlee, Haverford College, USA (3 co-authored papers, on-going work)
- Tim Oates, University of Maryland, USA (2 co-authored papers, co-organised event)
- François Denis, Aix-Marseille University, France (2 co-authored papers, ongoing project)
- Amaury Habrard, Saint-Etienne University, France (2 co-authored papers)
- Borja Balle, Lancaster University, UK, (1 co-authored paper, co-organised events)

- Ryo Yoshinaka, Kyoto University, Japan (1 co-authored paper, short visits)

Invited talks

- Invited speaker at the *Deep Learning and Formal Languages* workshop, ACL, Florence, Italy, 2019. Title: Distilling computational models from Recurrent Neural Networks
- Invited speaker at the *Journées annuelles de Vérification, GdR IM, Grenoble*, 2018. Title: Spectral Learning of Weighted Automata, from theory to a toolbox
- Invited speaker at the *Linguistic department of the Stony Brook University*, USA, 2018. Title: Recent advances in Grammatical Inference
- Invited speaker at the *ELC Workshop on Learning Theory and Complexity*, Kyoto, 2014. Title: Efficiency in the identification in the limit paradigm
- Invited seminar at the *Computer and Information Science department of the University of Delaware*, 2013. Title: Recent advances in grammatical inference of non-regular languages
- Invited seminar at the *Computer Science department of the University of Maryland, Baltimore County*, 2012. Title: Learning context-free grammars

Editing & Reviewing

- Co-editor of the 15th International Conference on Grammatical Inference, 2021
- Co-editor of a special issue on grammar learning for *Fundamenta Informaticae*, 2016
- Member of the program committee of the international conferences EMNLP-CoNLL'07, ICGI'08, ICGI'12, ICGI'14, ICGI'16, ICGI'18
- Reviewer for the *Machine Learning Journal* (2014, 2015, 2019), *Theoretical Computer Science* (2013, 2014, 2015, 2016), *Journal of Machine Learning Research* (2010, 2012, 2015), *Information Processing Letters* (2007), *Advances in Complex Systems* (2006)
- Reviewer for the international conferences ECML'05, ECML'10, ICML'15, NIPS'16, ICLR'18
- Reviewer for the francophone conference CAp'05, CAp'06, CAp'16, CAp'18, CAp'19

Tutoring

PhD

- Co-tutoring with Jeffrey Heinz and member of the PhD proposal and defence committees of Adam Jardine (University of Delaware, USA), 2013-2016
- Co-tutoring with Tim Oates of John Clemens (University of Maryland, Baltimore County, USA), 2012-2015
- Member of the thesis committee of Didier Villevalois (Aix-Marseille University), 2015-2019

MSc.

- Final internship and thesis of a MSc international student, subject: *Distillation of RNN*, 5 months, 2021
- Final internship and thesis of a MSc student, subject: *Inside the black-box: extracting WA from RNN*, 5 months, 2018
- Last year project of a MSc. Student, subject: *Automatic detection of typewriter model*, in collaboration with the French National Police Forensic Lab, 6 weeks, 2017
- Final internship of an applied MSc. student, subject: *Image classification via graph features*, 5 months, 2016

- Last year project of 4 applied MSc. students, subject: *Image indexation by content*, 6 weeks, 2011
- Last year project of 4 applied MSc. students, subject: *Development of a Firefox plug-in for film recommendation (allocine.fr)*, 6 weeks, 2010
- First year thesis (TER) of a MSc. student subject: *Learning formal languages: theory and practice*, 2009
- Final internship and thesis of a MSc. student, subject: *Statistical grammatical inference: from theory to implementation*, 5 months, 2008
- First year project of 3 MSc. students, subject: *Implementation of a grammatical inference algorithm*, 1 month, 2008
- First year thesis (TER) of a MSc. student, Subject: *Learning Languages defined with the use of String Rewriting Systems*, 2006
- First year thesis (TER) of a MSc. student, Subject: *Implementation of a learning algorithm: LARS*, 2005

Undergraduate: Two months internships of third year students. Subjects: *Development of a toolbox for spectral learning & Image classification via graph feature extraction & Machine Learning: teaching via examples & Automatic cancer detection from blood samples using Deep and Machine Learning*, 2014, 2015, 2018, 2019

Projects

- [ANR PRCE TAUDoS](#), 2021-2025, *Theory and Algorithms for the Understanding of Deep learning On Sequential data*. **Principal investigator**
- [INSERM MIC \(Cancer Plan\) AI4OP](#), 2020-2023, *Artificial Intelligence for Onco-Plasma*. **Principal investigator**
- [LabEx Archimède Scikit-SpLearn](#), 2015-2016, *Toolboxes for spectral learning*. **Principal investigator**
- [ANR DECODA](#), 2010-2013, *Speech Analytics in recorded call-center conversations*. Member
- [ANR LAMPADA](#), 2009-2014, *Learning Algorithms, Models and sPArse representations for structured Data*. Member
- [ANR SEQUOIA](#), 2009-2012, *Probabilistic syntactic analysis with large coverage of French*. Member
- [ANR MARMOTA](#), 2005-2008, *MAchine learning for pRobabilistic MOdels Tree lAnguages*. Member
- European networks of excellence PASCAL: *Pattern Analysis, Statistical modelling and ComputAtional Learning* (2003-2007). Member; and PASCAL2 (2008-2013). Local manager

Softwares

Implementation of 2 toolboxes for spectral learning, Sp2Learn and [Scikit-Splearn](#), during a 1 year LabEx Archimède project (both in production), Free BSD licensed

Pedagogical Responsibilities

- Member of the pedagogical team that created and launched the Master “[Signal and Image Treatment](#)”, 2017 – 2020

- Involve in the creation, the launching, and the development of the Master program “[Artificial Intelligence & Machine Learning](#)”, 2017 – 2020
- In charge of the Master program in computer science “[Advanced Data Bases](#)” 2009-2012
- In charge of the Master program in computer science “[Reliability and Security in Computer Science](#)” 2010 – 2012
- Head of the organisation committee and member of the scientific committee of the [PASCAL2 Bootcamp 2010](#), Marseilles, France

Collective Responsibilities & Science Animation

- Member of the numerical council of the IUT of Saint-Etienne, 2020 –
- Co-head of the [éQuipe d'AppRentissage de MArseille / Marseille Machine Learning Team \(QARMA\)](#) of the LIS UMR 7020, 2019 – 2020
- Head of the Steering Committee of the International Community in Grammatical Inference (2014 – 2018)
- Co-chair of the [International Conference on Grammatical Inference \(ICGI 2021\)](#), Manhattan, USA, 2021
- Co-chair of the [LearnAut 2019 workshop](#) Logic In Computer Science (LiCS 2019) conference,, Vancouver, Canada, 2019
- Co-chair of the [LearnAut 2018 workshop](#) at the Federated Logic Conference (FloC 2018), Oxford, UK, 2018
- Co-chair of the [LearnAut workshop](#) at the Logic In Computer Science (LiCS 2017) conference, Reykjavik, Iceland, 2017
- Co-organiser of the [SPiCe](#) on-line competition about learning the next symbol in sequences, 2016
- Co-organiser of the [PAutomaC](#) on-line competition about learning probabilistic finite state machines, 2012
- Elected at the council of the UFR (\approx French faculty) Mathematics - Computer Science - Mechanics of the University of Provence (2008 – 2012). Member of the research and pedagogic council of this UFR.
- Elected at the executive committee of the national association for computer science [SPECIF](#), 2009 – 2011
- Member of the organisation committee of [the first French spring school on Machine Learning](#), EPIT 2008, in charge of communication
- Member of the organisation committee of the SPECIF congress 2006, Saint-Étienne
- Member of the organisation committee of the grammatical inference workshop 2006, Saint-Étienne
- Elected at the council of the doctoral school of Saint-Étienne, 2002 – 2007
- President of the Association Stéphanoise des jEunes Chercheurs, 2003 – 2004
- Vice-president of the Association Stéphanoise des jEunes Chercheurs, 2004 – 2005
- Member of the executive committee of the Confédération des Jeunes Chercheurs, 2005 – 2007

Science Popularization

- Member of the organization committee of the [Treize Minutes Marseille](#), an evening of science popularization, 2014, 2015, 2016, 2017, 2018
- Co-creator and animator of the network [Communauté Française des Docteurs in Marseille](#), 2015
- Animation of a debate (“Causerie”) on the “*Black magic behing the Algorithm*”, at the [Fête de la science 2015](#), Villa méditerranée, Marseilles
- Talk titled “*Computer science : education, jobs and dangers*” at the French high school *La Condamine* of Quito (Ecuador), 2007
- Animation of a debate with high school students, titled “*To talk and to discuss with a computer*”, during the *Vogue du Net* organized by the town of Saint-Étienne in may 2006