

Rachid Riad | Curriculum Vitae

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Education

LSCP & NPI, ENS

Paris, FRANCE

PhD, Machine Learning and Speech Processing for Healthcare

Sept 2018–Avril 2022

Supervised by Anne-Catherine Bachoud-Levi and Emmanuel Dupoux

Speech and language processing toward precision neurology for Huntington's Disease.

ENS - Paris Saclay

Cachan, FRANCE

Master of Science, Machine Learning and Computer Vision, with Honours

2016–2017

Courses: Object recognition and Computer Vision, Modelization in Neuroscience, Numerical Imaging, Reinforcement Learning, Graphs in Machine Learning, Convex Optimisation, 3D points and modelization, Online Learning

Ponts Paristech

Paris, FRANCE

Engineering degree, Applied Mathematics and Computer Science,

2013–2017

Computer Science (C++, Python), Spectral Analysis, Operational Research, Data Analysis, Machine Learning, Financial mathematics, Optimization

Lycée Pierre de Fermat

Toulouse, FRANCE

Preparatory classes

2011–2013

Preparatory classes for the highly competitive entrance exams to the Grandes Écoles

Intensive preparation in Math and Physics

Experience

Industry.....

Callyope

Paris, France

Chief Technology Officer/Chief Scientific Officer

April 2022–Now

- Co-founder of Callyope, in charge of the tech and science in the company.
- Brain institute accelerator program

Mapjam

San Francisco, USA

Geo Software Engineer intern

October 2015–August 2016

- Building GIS Stack and complex mapping applications.
- 500 start-ups accelerator program

Vehicle Data Science

Oakland, USA

Software Engineer intern

September 2015–October 2015

- Data visualisation with D3.js and Leaflet.js

Bouygues Construction

Paris, FRANCE

Blue-Collar intern

September 2013 – October 2013

- Blue-collar work on a construction site

Research.....

Google Brain

Paris, FRANCE

Research intern, Deep Learning and Signal Processing

June 2021–Oct 2021

Supervised by Neil Zeghidour, David Grangier and Olivier Teboul
Spotlight at ICLR 2022
Patent submission

LSCP & NPI, ENS

Paris, FRANCE

PhD student, Machine Learning and Speech Processing for Healthcare Sept 2018–April 2022

Supervised by Anne-Catherine Bachoud-Levi and Emmanuel Dupoux

Speech and language processing toward precision neuropsychology for Huntington's Disease.

SPOClab, Vector Institute, University of Toronto

Toronto, Canada

Visiting Scholar

April 2018–September 2018

Supervised by Frank Rudzicz

Focus on Speech and Machine Learning for Health Behavior Informatics

Laboratoire de Neuropsychologie Interventionnelle(NPI), ENS

Paris, FRANCE

Research Engineer

October 2017–March 2018

Supervised by Anne-Catherine Bachoud-Levi and Emmanuel Dupoux

Building speech tools for Health Behavior Informatics

Co-supervision of a M2 intern in Machine Learning and Speech Processing

Laboratoire de Science Cognitive et Psycholinguistique(LSCP), ENS

Paris, FRANCE

Research Intern

April 2017–October 2017

Supervised by Emmanuel Dupoux

Discovery of linguistic units from acoustic speech and multi-modal views

Carnegie Mellon University's Language Technologies Institute

Pittsburgh, USA

Summer Research Intern

June 2017–August 2017

2017 Jelinek Summer Workshop on Speech and Language Technology, Rosetta Stone project,

CERMICS applied Mathematics laboratory Ponts Paristech

Paris, FRANCE

Research Intern

April 2014–August 2014

Supervised by Bernard Lapeyre

Study of financial Mathematics model

Teaching

ENS - Paris Saclay

Paris, FRANCE

Master of Science, Machine Learning and Computer Vision, Teaching Assistant 2020

Course: Algorithms for speech and natural language processing

ENS - Paris

Paris, FRANCE

Master of Science, Cognitive Science master, Adjunct Lecturer 2019

Course: Data-science: Do-it-yourself!

ENS - Paris Saclay

Paris, FRANCE

Master of Science, Machine Learning and Computer Vision, Teaching Assistant 2019

Course: Algorithms for speech and natural language processing

ENS - Paris Saclay

Paris, FRANCE

Master of Science, Machine Learning and Computer Vision, Teaching Assistant 2018

Course: Algorithms for speech and natural language processing

Talks, etc.

Psychiatry research seminar

Paris, FRANCE

Saint-Anne Hospital

September 2022

Using machine learning to obtain spoken language biomarkers in Huntington's Disease

LISTEN seminar <i>Telecom Paristech</i> Similarités et différences entre les algorithmes d'apprentissage automatiques et le système auditif humain.	Palaiseau, FRANCE <i>July 2022</i>
ICLR <i>Online</i> Learning strides in convolutional neural networks	Online <i>May 2022</i>
PhD <i>ENS, Paris</i> PhD Defence	ENS <i>April 2022</i>
CoCoDev seminar <i>Aix-Marseille University-ICLB</i> A holistic measure of inter-annotation agreement with continuous data	Marseille, FRANCE <i>February 2022</i>
Speech research seminar <i>University of Toronto</i> Using machine learning to obtain spoken language biomarkers in Huntington's Disease	Toronto, CANADA <i>February 2022</i>
Journée Sciences de la Vie et de la Santé <i>University of Créteil</i> Using machine learning to obtain spoken language biomarkers in Huntington's Disease	Créteil, FRANCE <i>February 2022</i>
La méthode scientifique <i>France Inter</i> Radio show to present my thesis	Paris, FRANCE <i>January 2022</i>
Audio Data Analysis and Signal Processing seminar <i>Telecom ParisTech</i> Learning spectro-temporal representation of complex sounds with parameterized neural networks.	Paris, FRANCE <i>March 2021</i>
Master IA-Health <i>University Paris Descartes</i> New objective measures with machine learning algorithms in neurology.	Paris, FRANCE <i>March 2021</i>
HEKA Seminar INRIA <i>ENS</i> Using machine learning to obtain spoken language biomarkers in Huntington's Disease.	Paris, FRANCE <i>January 2021</i>
LSP Seminar <i>ENS</i> Learning Spectro-Temporal representation of complex sounds with parameterized Neural Networks	Paris, FRANCE <i>September 2020</i>
Data Science week <i>Ponts Paristech</i> Speech and Natural Language Processing	Paris, FRANCE <i>February 2020</i>
SRPP seminar <i>Laboratoire de Phonétique et Phonologie, Sorbonne University</i> Identification of primary and collateral tracks in stuttered speech	Paris, FRANCE <i>April 2019</i>
Data Science week <i>Ponts Paristech</i> Discover linguistics units from acoustic speech and other modalities	Paris, FRANCE <i>February 2018</i>
Post-JSALT workshop <i>Univ. Grenoble Alpes (UGA)</i> Iterated unsupervised learning of acoustic and word units: a brief update	Grenoble, FRANCE <i>January 2018</i>

Awards and grants

Merit Scholarship

Ministry of Education

2-year scholarship awarded based on top grades obtained at the French baccalaureate and social criteria.

Paris, FRANCE

September 2011

PhD funding (accepted)

Ministry of Education

Received a 3-year Ph.D. funding given by the Ecole Normale Supérieure ED540.

Paris, FRANCE

September 2018

PhD funding (refused)

Frontières du Vivant

Refused a 3-year Ph.D. funding given proposed by Servier and Frontières du Vivant.

Paris, FRANCE

September 2018

PhD funding (refused)

Frontière du Vivant

Refused a 3-year Ph.D. funding given proposed by University of Créteil and the Life Sciences department.

Créteil, FRANCE

September 2018

Professional consultations

Strategic consulting

Naml Consulting

Consulting for Machine learning and natural language processing consulting, training of data scientists on advanced NLP techniques.

Paris, FRANCE

May 2022

Database consulting

Richemont

Database consulting for business intelligence queries.

Paris, FRANCE

April 2022

Scientific consulting

Langinnov

Literature review for speech-based technologies in language learning. Design of technical solution in the context of Langinnov app for bilingual children. Co-writing NSF grant application. Results: Langinnov was awarded 1M\$.

New-York, USA

October 2020

Computer skills

Programming Languages: Python, C++, bash **Machine Learning:** Pytorch, Tensorflow, Sklearn

Web development: HTML/CSS, JavaScript **Visualisation:** D3.js, Leaflet.js, Praat, Audacity

Databases: SQL, Postgres/Postgis, **OS:** Linux, Docker

Hobbies

Basketball: Team Captain and practice of Basketball at regional level for 10 years

Soccer: Member of the Ponts Alumni Soccer Team

Community service

- o Organisation of the career fair of three of the best engineering schools in France: this career fair hosts 3000 participants and has a 700k€turnover.
- o I have been part of the team elected at Ecole des Ponts to represent the students. I have organised the farewell trip for my school for 200 people, managing a 15-person team with a budget of 20k€.

References

Industry	Academia
o Neil Zeghidour Research Scientist at Google	o Pr. Emmanuel Dupoux
o David Grangier Research Scientist at Google	o Pr. Anne-Catherine Bachoud-Levi
o Scollay Petry CEO of Mapjam	o Pr. Coralie Chevallier
o Jack Scollay CFO of Mapjam	o Pr. Frederic Meunier

Publications

M. Poli, E. Dupoux, and **Riad, Rachid**, "Introducing topography in convolutional neural networks," *ICASSP*, 2023.

Riad, Rachid, O. Teboul, D. Grangier, and N. Zeghidour, "Learning strides in convolutional neural networks," *Oral and outstanding paper award at ICLR*, 2022, scores: 8-8-8-8.

Rachid Riad, M. Lunven, H. Titeux, X. N. Cao, J. H. Bagnou, L. Lemoine, J. Montillot, A. Sliwinski, K. Yousov, L. C. de Langavant, E. Dupoux, and A.-C. Bachoud-Lévi, "Predicting clinical scores in huntington's disease: a lightweight speech test," 2021, accepted to *Journal of Neurology*.

Riad, Rachid, J. Karadayi, A.-C. Bachoud-Lévi, and E. Dupoux, "Learning spectro-temporal representations of complex sounds with parameterized neural networks," *The Journal of the Acoustical Society of America*, vol. 150, no. 1, pp. 353–366, 2021. [Online]. Available: <https://doi.org/10.1121/10.0005482>

H. Titeux and **Rachid Riad**, "pygamma-agreement: Gamma γ measure for inter/intra-annotator agreement in python," *Journal of Open Source Software*, vol. 6, no. 62, p. 2989, 2021. [Online]. Available: <https://doi.org/10.21105/joss.02989>

C. Gallezot*, **Rachid Riad***, M. Lunven, H. Titeux, X. N. Cao, J. H. Bagnou, L. Lemoine, J. Montillot, A. Sliwinski, K. Yousov, L. C. de Langavant, E. Dupoux, and A.-C. Bachoud-Lévi, "Vocal and linguistic expression impairments of emotions in huntington's disease," 2021, submitted to *Cortex*, * Equal contribution.

Rachid Riad*, H. Titeux*, L. Lemoine, J. Montillot, A. Sliwinski, J. H. Bagnou, X. N. Cao, A.-C. Bachoud-Lévi, and E. Dupoux, "A comparison study on patient-psychologist voice diarization," 2021, under review, * Equal contribution.

Rachid Riad, H. Titeux, L. Lemoine, J. Montillot, J. H. Bagnou, X. N. Cao, E. Dupoux, and A.-C. Bachoud-Lévi, "Vocal markers from sustained phonation in huntington's disease," in *INTERSPEECH*, Shanghai, China, October 2020. [Online]. Available: <https://github.com/bootphon/sustained-phonation-features>

H. Titeux*, **Rachid Riad***, X.-N. Cao, N. Hamilakis, K. Madden, A. Cristia, A.-C. Bachoud-Lévi, and E. Dupoux, "Seshat: A tool for managing and verifying annotation campaigns of audio data," in *LREC*, Marseille, May 2020, * Equal contribution.

Rachid Riad, A.-C. Bachoud-Lévi, F. Rudzicz, and E. Dupoux, "Identification of primary and collateral tracks in stuttered speech," in *LREC*, Marseille, May 2020.

O. Scharenborg, L. Besacier, A. Black, M. Hasegawa-Johnson, F. Metze, G. Neubig, S. Stüker, P. Godard, M. Müller, L. Ondel, S. Palaskar, P. Arthur, F. Ciannella, M. Du, E. Larsen, D. Merckx, **Rachid Riad**, L. Wang, and E. Dupoux, "Linguistic unit discovery from multi-modal inputs in unwritten languages: Summary of the "speaking rosetta" JSALT 2017 workshop," in *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Calgary, Canada, April 2018. [Online]. Available: <http://www.phontron.com/paper/scharenborg18icassp.pdf>

Rachid Riad, C. Dancette, J. Karadayi, N. Zeghidour, T. Schatz, and E. Dupoux, "Sampling strategies in siamese networks for unsupervised speech representation learning," in *INTERSPEECH*, Hyderabad, India, September 2018. [Online]. Available: https://github.com/rachine/sampling_siamese2018

N. Holzenberger, M. Du, J. Karadayi, **Rachid Riad**, and E. Dupoux, "Learning word embeddings: unsupervised methods for fixed-size representations of variable-length speech segments," in *INTERSPEECH*, Hyderabad, India, September 2018.

O. Scharenborg, L. Besacier, A. Black, M. Hasegawa-Johnson, F. Metze, G. Neubig, S. Stüker, P. Godard, M. Müller, L. Ondel, S. Palaskar, P. Arthur, F. Ciannella, M. Du, E. Larsen, D. Merckx, **Rachid Riad**, L. Wang, and E. Dupoux, "Speech technology for unwritten languages," *IEEE ACM Transactions on Audio, Speech, and Language Processing*, vol. 28, pp. 964–975, Feb. 2020.

G. Neubig, M. Sperber, X. Wang, M. Felix, A. Matthews, S. Padmanabhan, Y. Qi, D. S. Sachan, P. Arthur, P. Godard, J. Hewitt, **Rachid Riad**, and L. Wang, "XNMT: The extensible neural machine translation toolkit," in *Conference of the Association for Machine Translation in the Americas (AMTA) Open Source Software Showcase*, Boston, March 2018.