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Andrea Alamia

Statistics – ISI [GoogleScholar]
(Updated 05/2022)
Publications: 32;
Citations: 543;

ACADEMIC POSITIONS

CNRS Reseracher (CRCN) from October 2021 at Centre de Recherche Cerveau et Cognition (CerCo - CNRS), Toulouse, France

Post-doctoral associate (August. 2019 – September 2021)

Serre Lab, Brown University, USA & Centre de Recherche Cerveau et Cognition, Toulouse, France
Supervisors: _Dr. Thomas Serre_ and _Dr. Rufin VanRullen_– NSF CRCNS USA-France Research grant

Summer Program Intern (June 2019 – August. 2019) :

RIKEN Center for Brain Science (CBS), Wako, Saitama, Japan
Supervisor: _Dr. Andrea Benucci_– Laboratory for Neural Circuits and Behavior

Post-doctoral associate (Sept. 2017 –June 2019) :

Centre de Recherche Cerveau et Cognition (CerCo - CNRS), Toulouse, France
Supervisor: _Dr. Rufin VanRullen_– ERC Consolidator Grant P-CYCLES

EDUCATION

PhD in Cognitive Neuroscience, F.R.S-FNRS (September. 2013 –August 2017)

Institute of Neuroscience, Université Catholique de Louvain (IoNS, UCL), Belgium
Supervisors: _Dr. Alexandre Zénon,_ _Prof. Etienne Olivier_, _Prof. André Mouraux_ - Aspirant F.R.S.-FNRS

PhD Fellowship - INNOVIRIS (November. 2012 –August 2013)

Institute of Neuroscience, Université Catholique de Louvain (IoNS, UCL), Belgium
Supervisors: _Dr. Alexandre Zénon_, _Prof. Etienne Olivier_

Master Degree in Biomedical Engineering (2009–2012)

Politecnico di Milano (Italy)
Supervisors: _Dr. Linda Pattini_, _Dr. Salvatore Cappadona (Utrecht University)_

Bachelor Degree in Biomedical Engineering (2006–2009)

Politecnico di Milano (Italy)
 Supervisor: _Prof. Giuseppe Andreoni_

GRANTS

- Toulouse Mind Brain Institute, call 2021 for M2 internship (€3000) – 'Learning abstract concept like an honeybee'
- ASP - _Aspirant_ F.R.S.-_FNRS_ – Research Fellow 4 years, 2013-2017
- March 2014 – '2014 **FENS Forum travel Grant**' awarded by the Belgian Society of Neuroscience
- '**CCN18 Travel Grant**' awarded at the Computational Cognitive Neuroscience Conference 2018

INVOLVEMENT IN THE SCIENTIFIC COMMUNITY

Head of the TIdDLe Organization Committee. TIdDLe is a group of Toulouse based researchers interested in Deep Learning. I'm in charge of coordinating and organizing most of the scientific meetings.

Invited Reviewer for the **journals**: Journal of Neuroscience, Plos Computational Biology, NeuroImage, Frontiers in Computational Neuroscience, Frontiers in Neuroscience, Journal of Motor Behavior, PlosOne, Journal of Cognition.
Invited Reviewer for the **grants:** 'Come to Wallonia' (C2W), Human Frontier Science Program Organization, Austrian Science Fund (FWF), Dutch Research Council (NWO).

Founder and organizer of the **DeepLearning Club** at Centre de Recherche Cerveau&Cognition (CerCo), Toulouse, 2017-2019

Organizer of the **Journal Club** at Centre de Recherche Cerveau&Cognition (CerCo), Toulouse, 2019-2020

- Invited talk at the "Forum des Sciences Cognitives, Toulouse – Intelligence(s)" at Université Paul Sabatier de Toulouse - 'Intelligence Artificielle: les algorithms pensent-ils?" – 24-05-2022.
- Invited speaker for a debate after the projection of the film 'Cinq nouvelles du cerveau' at the 'Utopia' cinema in Tournefeuille – 21-03-2022.
- "New study shows how DMT refreshes perceptions" in 'Lucid News' 22nd-may-2020 (https://www.lucid.news/how-dmt-refreshes-perceptions/?fbclid=IwAR20QnjSiDUJOr4s26ucVPaCrh1ZSYazkQ5JRH0qxQAtF5nmu32QQQoxSMQ)
- "L'inconscient doit encore faire ses preuves" in 'Pour La Science' 27th-may-2019 (https://www.pourlascience.fr/sd/neurosciences/linconscient-doit-encore-faire-ses-preuves-17067.php)

Graduate Students co-supervision (main supervisor : Dr. Rufin VanRullen):
- Zhaoyang Pang (2018 - 2021)
- Canhuang Luo (2017 – 2020)

Master Students direct supervision:
- Can Pouliquen *"Predictive Coding and oscillatory dynamics in deep networks"* – 2022 – co-supervised with Dr. Rufin VanRullen
- Asmae Belmahi *"A machine learning approach to the functional origin of brain oscillations"* – 2022
- Nathan Gaubil *"Learning abstract concept like an honeybee"* – 2022
- Yifan Zeng *"Oscillatory travelling waves in a working memory task"* - 2021
- Loukas Benazt *"Fooling the eye: when Predictive Coding generates visual illusions"* – 2020
- Malo Renaud D'Ambra *"Alpha oscillation and its inhibitory role in visual selection : an EEG study"* – 2020
- Lucie Terral *"Travelling waves and their cognitive functions: a predictive coding interpretation"* – 2020
- Victor Gauducheau *"Artificial Grammar and Neural Network"* – 2018
- Dimitri Paisios *"Recurrent Networks and Artificial Grammar learning"* – 2018
- Marie Victoire de Lassus *"Can pupillometry contribute to the assessment of empathy"* – 2016/2017
- Laureen Slongo *"Luminance on saccadic suppression induced by covert shifts of attention"* - 2014/2015

Supervision of 5 students' joint report titled *'Predictive Coding for Deep Neural Networks'*, related to their 'Travaux d'Initiation à la recherche' ('TIR', "initiation works to research") in first year master of Computer Science at the Université Paul Sabatier – 2021/2022

Teaching two theoretical and practical seminars about TMS technique in the course **"Bio-Instrumentation"** (2015-2016, 2016-2017 - UCL), hold by Prof. André Mouraux. Total hours: 10.

Alamia A., Lucie Terral, Malo Renaud D'ambra., VanRullen R. (**under revision**) "Distinct role of forward and backward alpha-band waves in spatial attention"

Alamia A., Mozafari M., Choksi M., VanRullen R. (**2023**) "On the role of feedback in visual processing: a predictive coding perspective" Neural Networks 157, 280-287

Vaishnav M., Cadene R., **Alamia A.,** D Linsley, VanRullen R**.,** Serre T.(**2022**) "Understanding the computational demands underlying visual reasoning" Neural Computation

Van Bree S., **Alamia A.,** Zoefel B. (**2022**) "Oscillations or not- why we can and need to know" European Journal of Neuroscience

Choksi M., Mozafari M., O'May C., Ador B., **Alamia A.,** VanRullen R. (**2021**) "Predify: augmenting deep neural networks with brain-inspired predictive coding dynamics" Advances in Neural Information Processing System 34, (NeurIPS)

VanRullen R., **Alamia A.** (**2021**) "GattaNet: Global agreement for convolutional neural networks" ICANN2021

Alamia A., Luo C., Ricci M., Kim J., Serre T., VanRullen R. (**2021**) " Differential involvement of EEG oscillatory components in sameness vs. spatial-relation visual reasoning tasks" eNeuro 10.1523/ENEURO .0267-20.2020

Luo C., VanRullen R., **Alamia A.** (**2021**) "Conscious perception modulates perceptual echoes" Neuroscience of Consciousness

Alamia A., Gauducheau V., Paisios D., VanRullen R. (**2020**) "Comparing feedforward and recurrent neural network architecture with human behavior in Artificial Grammar Learning" Scientific Reports 10(1), 1-15

Alamia A., Timmermann C., Nutt D.J., VanRullen R., Carhart-Harris R. (**2020**) " DMT alters cortical travelling waves" eLife 9:e59784

Choksi M., Mozafari M., O'May C., Ador B., **Alamia A.**, VanRullen R. (**2020**) "Brain-inspired predictive coding dynamic improve the robustness of deep neural networks" 2nd SVRHM Workshop, NeurIPS 2020

Pang Z., **Alamia A.**, VanRullen R. (**2020**) "Turning the stimulus on and off changes the direction of alpha travelling waves" eNeuro, 7(6), ENEURO.0218-20.2020

Alamia A., VanRullen R. (**2019**) "Alpha oscillations and travelling waves: signatures of predictive coding?" PLOSBiology, 17(10), e3000487

Alamia A., VanRullen R., Pasqualotto E., Mouraux A., Zenon A. (**2019**) "Pupil responds to unconscious surprisal". Journal of Neuroscience, 3010-18

Alamia A., Zenon A., VanRullen R., Duque J.,Derosiere G..(**2019**) "Unconscious perceptual cues drive oscillatory activity in the motor cortex during action selection ". Neuroimage, 186, 424-436

Alamia A., Solopchuk O., Zenon A. (**2018**) "Strong conscious cues suppress preferential gaze allocation to unconscious cues". Frontiers in Human Neuroscience, 12:427.

Filibrich L., Halicka M., **Alamia A.**, Legrain V. (**2018**) "Investigating the spatial characteristic of the cross-modal interaction between nociception and vision using gaze direction". Consciousness and Cognition 57, 106-115

Filibrich L., **Alamia A.**, Burns S., Legrain V., (**2017**) "Orienting attention in visual space by nociceptive stimuli: investigation with a temporal order judgment task based on the adaptive PSI method". Experimental Brain Research,235(7), 2017

Derosiere G., Zenon A., **Alamia A.**, Duque J., (**2017**) "Primary motor cortex contributes to the implementation of implicit value-based rules during motor decisions". Neuroimage, 146, 1115-1127

Vanderclausen C.,Filibrich L., **Alamia A.**, Legrain V. (**2017**) "Investigating peri-limb interaction between nociception and vision using spatial depth ". Neuroscience letters 654, 111-116

Filibrich L., **Alamia A.**, Blandiaux S., Burns S., Legrain V. (**2017**) "Shaping visual space perception through bodily sensations: testing the impact of nociceptive stimuli on visual perception in peripersonal space with temporal order judgment task". Plos One, 12(8)

Filibrich L., **Alamia A.**, Verfaille C.,Berquin A., Barbier O., Libouton X.,Fraselle V., Mouraux D., Legrain V. (**2017**) "Biased visuospatial perception in complex Regional Pain Syndrome ". Scientific Report 7(1), 9712

Solopchuk O.,**Alamia A.**, Dricot L., Duque J., Zenon A. (**2017**) "cTBS distruption of the Supplementary Motor Area perturbs sequence representation but not performance ". Neuroimage 163, 34-40

Alamia A., de Xivry J.J., Anton E., Olivier E., Cleeremans A., Zenon A. (**2016**) "Unconscious associative learning with conscious cues". Neuroscience of Consciousness 1-10.

Alamia A., Solopchuk O., D'Ausilio A., Van Bever V., Olivier E., Zenon A. (**2016**) "Disruption of Broca's Area Alters Higher-order Chunking Processing during Perceptual Sequence Learning". Journal of cognitive neuroscience. Vol 28, N°3, p.402-417.

Alamia A., Solopchuk O., Olivier E., Zenon A. (**2016**) "Non-parametric algorithm to isolate chunks in response sequences ". Frontiers in Behavioral Neuroscience, 10:177.

Alamia A., Zenon A. (**2016**) "Statistical Regularities Attract Attention when Task-Relevant". Frontiers in Human Neuroscience, 10:42.

Solopchuk O.,**Alamia A.**, Zenon A. (**2016**) "The Role of the Dorsal Premotor Cortex in Skilled Action Sequences ". Journal of Neuroscience 36,(25) 6599-6601

Solopchuk O.,**Alamia A.**, Olivier E., Zenon A. (**2016**) "Chunking improves symbolic sequence processing and relies on working memory gating mechanisms ". Learning and Memory 23, p.108-112

Torta D., Tatu M.K., Cotroneo D., **Alamia A.**, Folegatti A., Trojan J. (**2016**) "Prism adaptation contrasts perceptual habituation for repetitive somatosensory stimuli". Acta Psychologica

Zenon A., Klein PA., **Alamia A.**, Boursoit F., Wihelm E., Duque J. (**2015**) "Increased Reliance on Value-based Decision Processes Following Motor Cortex Disruption". Brain Stimulation 8(5):957-964.

Zenon A., Corneil B.D., **Alamia A.**, Filali-Sadouk N., Olivier E. (**2014**) "Counterproductive Effect of Saccadic Suppression during Attention Shifts". PLoS ONE 9(1):e86633.

"Which neural networks match human performance in artificial grammar learning"– **A. Alamia**, V. Gauducheau, D. Paisios, R. VanRullen – "Computational Cognitive Neuroscience", Berlin, September, 2019

"Automatic regularization of second-order Wienere kernels interacting corollary discharges"– D. Lyamzin, **A. Alamia**, R. Aoki, M. Abdolrahmani, A. Benucci – "Neuro2019", Niigata, July, 2019

"Differential involvement of EEG oscillations in identity vs spatial-relation reasoning tasks"– **A. Alamia**, Canhuang Luo, Matthew Ricci, Thomas Serre, R. VanRullen – "Vision Science Society", St. Pete, May, 2019

"Predictive coding produces alpha-band rhythmic travelling waves"– **A. Alamia**, R. VanRullen – "Conference on Cognitive Computational Neuroscience", Philadelphia, September, 2018

"Non-Bayesian weighting of implicit and explicit information in a motion discrimination task"– **A. Alamia**, V. Moens, E. Olivier, A. Zenon – "Cognitive Neuroscience Meeting", New York, April, 2016

"A novel implicit associative learning framework : validation, role of attention and relation to Bayesian decision making"– **A. Alamia**, A.Cleeremans, E. Olivier, A. Zenon – "Society for Neuroscience", Chicago, October, 2015

"New method to identify chunks finds no evidence for concatenation"– **A. Alamia**, O. Solopchuk, E. Olivier, A. Zenon – "Belgian Society for Neuroscience", Moens, May, 2015

"Implicit Learning: a new design to unveil the unconscious brain"– **A. Alamia**, J.J. Orban de Xivry, A.Cleeremans, E. Olivier, A. Zenon – "Neuronus", Krakow, April, 2015

"Implicit Learning: a stimulus-response framework"– **A. Alamia**, J.J. Orban de Xivry, E. Olivier, A. Zenon – "Neuro-cognitive mechanisms of conscious and unconscious visual perception", Delmenhorst, July, 2014 and 9th FENS Forum of Neuroscience, Milano, July, 2014

" Implicit statistical learning and pupil size: an untold love story" – **A. Alamia**, E. Olivier, A. Zenon- "Belgian Brain Council 2014"- Ghent, October, 2014

"Allocation of visual attention during the learning of first- and second-order statistics of a dynamic environment"– **A. Alamia**, E. Olivier, A. Zenon- "Rovereto Attention Workshop" - Rovereto, October, 2013

- "Alpha oscillations and traveling waves: signatures of Predictive Coding?" symposium at ICON2022
- "Brain oscillations and traveling waves" Paris-Toulouse workshop, March 2022
- "A predictive coding perspective on oscillatory travelling waves" Dugué lab, France November, 2021
- "A predictive coding perspective on oscillatory travelling waves" TMBI Toulouse, France September, 2021
- "A predictive coding perspective on oscillatory travelling waves" Invited talk at online meeting, 'Neuro reading group' University of Maryland, October, 2021
- "A predictive coding perspective on oscillatory travelling waves" Invited talk at online meeting, Birmingham, UK June, 2021
- "Automatic regularization of second-order Wiener kernels interacting corollary discharges" – presentation of the Summer Program work, Saitama, Japan – August, 2019
- "Networks and Complexity", "Models of Consciousness", Winter school ECHARP,– Aragnouet, France - January, 2018
- "Unconscious learning: behavioral evidence, relationship with attention and physiological markers" – Invited talk at 'Purpan' Hospital, Toulouse, France – April, 2017
- "Unconscious processing: studying the dark side of the brain" COSY Seminar, Louvain La Neuve, Belgium – October, 2016
- "Unconscious learning: when your brain knows more than you do " Mechanisms of conscious and unconscious learning – Fourth annual meeting PAI / IAP 7/33, Louvain La Neuve, Belgium – December the 3rd 2015
- "Unconscious learning: when your brain knows more than you do " UCL - Phd Day, Bruxelles – November, 2015

RIKEN CBS Lecture course 2019 (01/07/2019 – 05/07/2019) – RIKEN CBS – Tokyo, Japan

Computational Psychiatry Course 2017 (28/08/2017 – 01/09/2017) – University of Zurich & ETH Zurich, Switzerland.

International Deep Learning Summer School 2017 (17/07/2017 – 21/07/2017) – University of Deusto – Bilbao, Spain

Athens Course (11/03/2011 – 19/03/2011) Universidad Politecnica de Madrid (UPM), Spain – 7.5/10

"Exact String Pattern Recognition"- Prof. Francisco Gomez Martin

SICC *(Italian Society Chaos and Complexity)* **Course** - 8-10 May 2012
"Paradigmatic Models in Social Sciences"- Prof. Sergio Rinaldi

ISF *(Engineers without borders)* **Course -** April 2011 - May 2011
"Development Prospective through Migrations"- Prof. Irene Bengo

Online Courses (Coursera.org platform, credits free)

Machine Learning - Prof. Andrew NG (U. of Stanford)	92.4%
Networked Life - Prof. M. Kerns (U. of Pennsylvania)	99.3%
Model Thinking - Prof. Scott Page (U. of Michigan)	93.8%
Drugs and the Brain – Prof. Henry Lester (Caltech U.)	98.2%
Exploring Quantum Physics – Prof. Victor Galitski (U. of Maryland)	62.1%
Synapses, Neurons and Brain – Prof. Idan Segev (H. U. Jerusalem)	79.9%
Social Psychology- Prof. Scott Plous (Wesleyan U.)	81.1%
Animal Behavior – Prof. Mark Elgar (U. Melbourne)	95.3%

Matlab– advanced (>10 years)

Python– advanced (Numpy, Tensorflow, Pytorch)

R– basic

Brain Voyager (fMRI analysis)- intermediate

C/C++- basic

HTML- basic

Working experience with:

TMS, EEG, fMRI, Eye Tracker (EyeLink1000)

Data Analysis frameworks:

Machine Learning models, Bayesian Statistics (JASP, R), Frequentist Statistics (R).

Internship in the Biomedical Engineering department (April – June 2009): at "Istituto Nazionale Neurologico 'Carlo Besta' ", in Milano - with a focus on management of medical instrumentation, and attending the planning and execution of an open brain computer-assisted surgery.

Private Tutor (2006 - 2012) of mathematics and physics for High School students.

Classical Guitar **- Intermediate Accomplishment** (2010) at "Conservatorio di Milano - Giuseppe Verdi"

Music Theory and 'Solfeggio' (2007) at "Istituto Pareggiato Vittadini di Pavia"

Black belt in **Judo** and former competitor athlete

Breakdance teacher at "SalsaSwing" (BovisioMasciago) and "PalazzoloSport" (Palazzolo Milanese) - (2006 - 2011)

Experienced traveler and amateur mountain excursionist (summit peaks: Hoverla - 2061mt, **Ukraine** 2015; Kota Kinabalu - 4095mt, **Malaysia** 2016; PoonHill- 3193, **Nepal** 2017)

English: Spoken, written: Fluent

French: Spoken, written: Advanced

Spanish: Spoken, written: Intermediate

Italian: Mother tongue

REFERENCES

Dr. Rufin VanRullen *(Postdoc supervisor)*
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Centre de Recherche Cerveau et Cognition ; Hopital de Purpan ; 31052 Toulouse Cedex (France)

Dr. Alexandre Zénon *(PhD supervisor)*
alexandre.zenon@u-bordeaux.fr
Motor Control and Cognition ; Université de Bordeaux ; 33076 Bordeaux cedex (France)

Dr. Thomas Serre *(Postdoc supervisor)*
thomas.serre@brown.edu
Serre Lab ; Brown University ; 190 Thayer St, Providence, RI 02912 (USA)

Prof. André Mouraux *(PhD supervisor)*
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