

Curriculum vitae

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Birthdate: July 20, 1984
Birthplace: Lisbon, Portugal
Citizenship: Portuguese



Thesis

Doctor of philosophy : Ecological Perspectives on Local Statistics of Images, 2014
Master of Science : Gaussian Foveation, 2008

Education

2015, Workshop on C++ for intermediate level, INRIA, France
2009 - 2014, PhD. Computational Neuroscience, Johann Goethe Universität - Frankfurt, Germany
2009, IURS Summer school on Visuomotor Interaction, Benicàssim, Spain
2007, Erasmus student, Informatics department of Technische Universität Darmstadt, Germany
2006 - 2008, MSc. Applied Mathematics and Computation Theory, Instituto Superior Tecnico, Portugal
2002 - 2006, BSc. Applied Mathematics and Computation Theory, Instituto Superior Tecnico, Portugal

Working experience

2022, ATER (equivalent to lecturer), LASSI, UPEC, France in collaboration with Prof. Corinne Lagorre
2022, Teaching assistant at Neuromatch academy in computational neuroscience
2019, Career break for maternity leave
2017 - 2022, Postdoc, U2IS, ENSTA-PARIS, IPParis in collaboration with Prof. Antoine Manzanera

- *Proposed and tested an extension for the algorithm Expectation Maximization to improve its performance on an incremental learning setup.*
- *Developed and tested a new curiosity principle for a domestic robot based the Fisher information gain*
- *Supervised 4 Master intenrship, cosupervised 1 Master internships.*

- 2017 - 2021, Lecturer, U2IS, ENSTA-PARIS, IPParis.
- 2019 - 2021, Main professor of “Neural-computational models of vision”
Responsible for the syllabus, theoretical and exercise classes, and evaluation
 - 2019, Teaching assistant of “Probabilistic and statistics models”
Contributed to syllabus, exercises and evaluation
 - 2018, Main professor of “Introduction to Matlab”
Responsible for the syllabus, exercises and evaluation
 - 2017 - 2018, Invited professor of “Neural-computational models of vision”
Contributed to theoretical and exercise classes, and evaluation
 - 2017, Teaching assistant of “Vision for autonomous robots”
Contributed to exercise classes, and evaluation
- 2015, Career break for maternity leave
- 2014 - 2016, Postdoc, BioVision Team, in collaboration with Dr. Bruno Cessac and Dr. Pierre Kornprobst, INRIA Sophia Antipolis, France
- *Developed new techniques for the analysis and modeling of retinal spiking data*
 - *Developed freeware for analysis and simulation of spiking data.*
 - *Contributed to the deliverables and review reports of the European Commission project Renvision.*
- 2009 - 2014, PhD Candidate, group of Prof. Constantin A. Rothkopf and Prof. Jochen Triesch, Frankfurt, Institute for Advanced Studies, Johann Goethe Frankfurt University, Germany
- *Developed models of the natural stimulus’ spatial properties and the ecological consequences on optimal encoders of such stimulus. Contributed to one journal article and several conference abstracts.*
 - *Participated in the “night of science”, a science workshop for university students.*
 - *Organized group meetings, journal clubs, and seminar classes.*
 - *Co-supervised 2 Master internships*
- 2008, Visiting researcher, working with Prof. Zoran Ognjanović, Institute of Mathematics of the Serbian Academy of Arts and Science, Serbia
- *Explored and exploited the properties of Probabilistic Logic. Contributed to a research report.*
- 2007 - 2008, Research Assistant, under supervision of Prof. Alexandre Bernardino, Vislab, Institute for Systems and Robotics, Portugal
- *Developed and tested new bio-inspired method for image acquisition. Contributed to one conference article*
- 2007 - 2008, Tutorial teacher for secondary and high school students.
- *Contributed to the success of several students of different ages, by helping with their homework and new exercises in mathematics and physics*
- 2007 - 2008, Home school teacher of high school level
- *Responsible of the class, including: theory, exercises and evaluation in mathematics*
- 2007, Research Assistant, group of Prof. Bern Schiele, Technical University of Darmstadt, Germany
- *Contributed with tools for testing segmentation algorithms*
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Grants and funding

- Name: 2A2C

Funding Organization: Direction générale de l'armement, Ministère des armées, FRANCE

Period of Grant Award: 01/01/2019 - 31/12/2021

Title of Project: Apprentissage Actif, Consolidation et Curiosité dans les systèmes de vision duale

Role on Project: Leader/Postdoc

➤ Name: RENVISION

Funding Organization: European Commission, IP project FP7-ICT-2011-9

Period of Grant Award: 2014 - 2016

Title of Project: Retina-inspired ENcoding for advanced VISION tasks

Role on Project: Postdoc

➤ Name: Frankfurt Vision Initiative

Funding Organization: Nationales Bernstein Netzwerk Computational Neuroscience, Förderinitiative des Bundesministeriums für Bildung und Forschung

Period of Grant Award: 2009 - 2014

Title of Project: Bernstein Focus: Neurotechnology

Role on Project: PhD candidate

Research interests

- Computational neuroscience: retina, vision, efficient coding, receptive fields, spiking data analysis, maximum entropy methods, population coding
 - Machine learning: unsupervised, probabilistic, reinforcement, active, continual learning
 - Robotics: curiosity, active sensing, dual vision, embodiment, decision making
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I.T. and programming skills

- Programming languages: Matlab (advanced), Python (advanced), C++ (intermediate), SQL (elementary), C (elementary), Java (elementary), C#(elementary)
 - Operative systems: Ubuntu, Fedora, Windows
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Service

- Interview to the national radio of Serbia on robotics and machine learning
 - Student's representant in FIAS board meetings.
 - Organizer of "science night" of Frankfurt University
 - Reviewer for: PLOS One, CLVISION workshop, Women in Machine Learning workshop, IEEE Artificial Intelligence & Knowledge Engineering, Brain-PIL workshop
 - Mentor: Women in Machine Learning workshop, young french mathematiciens workshop
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Language skills

- Portuguese (native)
- English (advanced)
- French (intermediate)

- German (elementary)
- Turkish (beginner)

Research experience

Theses

PhD Thesis: Ecological Perspectives on Local Statistics of Images, 2014

MSc Thesis: Gaussian Foveation, 2008

Journal articles

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Can the local statistics of the natural input explain retinal ganglion cell anisotropies? (under preparation)

Pamplona, D.; Hilgen, G.; Hennig, M.; Cessac, B.; Sernagor, E.; Kornprobst P.; Large visual neuron assemblies receptive fields estimation using a super-resolution approach, Journal of Neurophysiology, 2022

Cessac, B.*; Kornprobst, P.*; Kraria, S.*; Nasser, H.*; **Pamplona, D.***; Portelli, G.*; Vieville T.* PRANAS: A New Platform for Retinal Analysis and Simulation, Frontiers NeuroInformatics, 2017 *Authors in alphabetic order

Hilgen, G.; Pirmoradian, S.; **Pamplona, D.**; Kornprobst, P.; Cessac, B.; Hennig, M.H.; Sernagor E.; Pan-retinal characterisation of Light Responses from Ganglion Cells in the Developing Mouse Retina, Scientific Reports, 2017

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Power spectra of the natural input to the visual system, Vision Research, 2013

Conference articles

Pamplona, D.; Manzanera A.; Naturally Constrained Online Expectation Maximization, International Conference on Pattern Recognition, 2021

Sato, Y.D.; Jitsev, J.; Bornschein, J.; **Pamplona, D.**; Keck C.; von der Malsburg, C.; A Gabor Wavelet Pyramid-Based Object Detection Algorithm, International Symposium on Neural Networks, 2011

Pamplona, D.; Bernardino, A.; Smooth Foveal Vision with Gaussian Receptive Fields, 9th IEEE - RAS International Conference on Humanoids Robots, 2009

Conference abstracts

Pamplona, D.; Manzanera A.; Uncertainty driven gaze selection, European Conference on Eye Movements (oral presentation), 2022

Pamplona, D.; Manzanera A.; Naturally Constrained Online Expectation Maximization, Conférence sur l'Apprentissage automatique, 2021

Cessac, B.*; Kornprobst, P.*; Kraria, S.*; Nasser, H.*; **Pamplona, D.***; Portelli, G.*; Vieville T.*; ENAS: A new software for spike train analysis and simulation, Bernstein Conference 2016, *Authors in alphabetic order

Hilgen, G.; Softley, S.; **Pamplona, D.**; Kornprobst, P.; Cessac, B.; Sernagor, E.; The effect of

retinal GABA Depletion by Allylglycine on mouse retinal ganglion cell responses to light, European Retina Meeting, 2015

Pamplona, D.; Hilgen, G.; Cessac, B.; Sernagor, E.; Kornprobst, P.; A super-resolution approach for receptive fields estimation of neuronal ensembles, 24th Annual Computational Neuroscience Meeting (CNS), 2015

Pamplona, D.; Cessac, B.; Kornprobst, P.; Shifting stimulus for faster receptive fields estimation of ensembles of neurons, Computational and Systems Neuroscience (Cosyne), 2015

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Can the eye's imaging process explain ganglion cells anisotropies?, European Conference in Visual Perception, 2013,

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Eye's imaging process explains ganglion cells anisotropies, Computational and Systems Neuroscience (Cosyne), 2013

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; The statistics of looking: Deriving properties of retinal ganglion cells across the visual field, 12th Annual meeting of the Vision Sciences Society (oral presentation), 2012

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Predicting Ganglion Cells Variability, Computational and Systems Neuroscience (Cosyne), 2011

Pamplona, D.; Triesch, J.; Rothkopf, C. A.; Edge and image statistics across the visual field, Bernstein Conference, 2011

Pamplona, D.; Weber, C.; Triesch J.; Foveation with optimized receptive fields, Bernstein Conference, 2009

Tushev G.; Liu, M.; **Pamplona, D.**; Bornschein, J.; Weber, C.; Triesch J.; Foveated Vision with FPGA Camera, Bernstein Conference (demo), 2009

Invited talks








- 2022, Active but costly - Modeling eye movements for uncertainty reduction of embodied systems, ETIS, CY Cergy Paris Université, Paris, France
- 2020, On the bio inspired modeling of vision, IUT de CY Cergy Paris Université, Paris, France
- 2018, Neurosciences computationnelles et applications à la robotique, Rendez-Vous des Jeunes Mathématiciennes (RJM), association Animath, Palaiseau, France
- 2018, PRANAS: a tool for retinal data analysis, Annual Students Symposium of the Institut du Cerveau et de la Moelle épinière (ICM) Paris, France
- 2017, Embodied action perception loops, ENSTA-Paris, France
- 2016, Retinal data analysis: from single to population level, Renvision Workshop, Genova, Italy
- 2014, Space variant vision for scene classification, Group of Prof. Dr. Visvanathan Ramesh - University of Frankfurt, Frankfurt
- 2010, Space variant vision for robot applications, Vislab, ISR, IST, Portugal







Teaching experience

Supervised MSc thesis/ research internships

- 2021, Lam, J.P., Apprentissage incrémental de segmentation sémantique d'un robot domestique (Incremental learning of semantic segmentation using a domestic robot)
- 2020 Li, X., A Deep Convolutional Neural Network For Semantic Segmentation: Adaptability of the network
- 2018, Hmila, D., Learning the Principal Components of Images: Studying Catastrophic Forgetting and Solutions
- 2018, Hasni, A., Learning eye movements to maximize information
- 2017, Daoud, B., Les Statistiques d'ordre supérieur des images naturelles (High order statistics of natural images)
- 2010, Tushev, G., Designing a foveation system for an FPGA camera
- 2010, Xiu, L. Integration of an FPGA camera with a linux system

Classes details

Class	Magistral / Exercises	Level	Length (hour)	N. Students	Lang.	Exercises
Mathematics and Physics tutorial	M E	Sec.+ High	300	6		Hand-written
Visual perception and learning	M E	2 Eng 1 MSc	18	40		Hand-written python
Vision for autonomous systems	E	3 Eng 2 MSc	6	20		C++
Introduction to Matlab	E	1 Eng 3 BSc	21	20		Matlab
Probabilistic and Statistical models	E	2 Eng 1 MSc	9	20		Hand-written python
Neuro-computational models of vision	M E	2 Eng 1 MSc	63	20		Hand-written python
Computational Neuroscience	E	PhD	100	7		python

Data analysis and processing	M + E	2 Eng 1 MSc	102	30	 	python
Methods, data and algorithms	M + E	2 Eng 1 MSc	40	15	 	python
Object oriented programming	E	1 BSc	42	15	 	python