

# Marine VERNET, Ph.D., Engineer

Research Scientist at NIH

Cognitive Neuroscience

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## EDUCATION

- 2006-2009 **PhD in Cognitive Neurosciences**, School: Brain, Cognition & Behavior, University Paris 6 (UPMC)
- 2005-2006 **Master 2 in Cognitive Neuroscience (Cogmaster)**, Ecole des Hautes Etudes en Sciences Sociales, Paris
- 2002-2005 **Engineer in Physics**, Ecole Supérieure de Physique Chimie Industrielles de la Ville de Paris (ESPCI-ParisTech)
- 2000-2002 **Scientific preparation for French Engineering Schools**, PCSI, PC\*, Lycée Henri IV, Paris

## PROFESSIONAL EXPERIENCE

### *Academic research & R&D*

- 2016-present **Post-doctoral research:** networks of conscious perception; direction: Dr. Leslie G. Ungerleider, Laboratory of Brain and Cognition (NIMH, NIH, Bethesda MD, USA)
- 2013-2015 **Post-doctoral research:** oscillations, synchronizations and conscious perception in healthy adults and in patients (epilepsy); direction: Dr. Antoni Valero-Cabre, FrontLab team directed by Bruno Dubois & Richard Levy, Brain and Spine Institute ICM (CNRS, Inserm, University Paris 6, Paris, France)
- 2010-2012 **Post-doctoral research:** brain reactivity and connectivity at rest and during visuo-motor or perceptive tasks in healthy adults and in patients (traumatic brain injuries, epilepsy); direction: Pr. Alvaro Pascual-Leone, CNBS (Harvard, Boston MA, USA)
- 2006-2009 **PhD research:** cerebral basis of the binocular motor coordination; exploration of cognitive function via eye movements in healthy adults and in patients (dementia, tinnitus); direction: Dr. Zoï Kapoula, IRIS Laboratory (CNRS, Paris, France)
- 2005 **Research project:** participation in a new DNA-chip realization: detection of adsorption and hybridizing of RNA on micro mechanical device (phase integration interferometer); direction: Dr. Jean-Paul Roger, laboratory of Physical Optics (ESPCI, Paris, France)
- 2005 **Research project:** development of an imaging system for detection and co-localization of fluorescent proteins; direction: Dr. Martin Oheim, laboratory of Neurophysiology (University Paris 5, CNRS, INSERM, Paris, France)
- 2004 **Engineer internship:** conception of a gas meter calibrating bench, preliminary tests, training of engineers of the SMAR firm, editing of the system book; direction: Rui Gomes (Instituto de Pesquisas Tecnologicas, São Paulo, Brazil)

### *Academic Teaching*

- 2014-2015 **Art and Neuroscience**, Art-Therapy master (5<sup>th</sup> year), University Paris 5 (2.5 hours)
- 2014-2015 **Noninvasive brain stimulation lecture and practical**, Cognitive Science master (Cogmaster, 4<sup>th</sup>-5<sup>th</sup> year) & Integrative Biology and Physiology master (BIP, 5<sup>th</sup> year), University Paris 6 (7.5 hours)
- 2011-2012 **TMS course practical and lecture**, CNBS, Harvard Medical School, Boston MA, USA (22 hours)
- 2009 **Physics**, faculty of pharmacy (1<sup>st</sup> year), University Paris 11 (39 hours)
- 2009 **Eye movement physiology**, optometry formation (4<sup>th</sup> year), University Paris 11 (3 hours)

### *Knowledge diffusion, Animation*

- 2010 **Redaction of comments on research articles**, addressed to an audience of psychologists (<http://le-cercle-psy.scienceshumaines.com>)
- 2008-2009 **Presentation of Physics experiments** to a general audience at the science museum "Palais de la Découverte", Paris

## SCIENTIFIC, TECHNICAL AND COMPUTER SKILLS

Multidisciplinary scientific culture (Physics, Chemistry, Biology and Cognitive Neuroscience)

Experiment programming and data analysis (e.g., MatLab & EEGLab, AFNI)

Specialized skills:

- Fonctional Magnetic Resonance Imaging (fMRI)
- Electroencephalography (EEG)
- Transcranial Magnetic Stimulation (TMS) and Transcranial Electric Stimulation (tDCS/tACS)
- Video-oculography and Posturography

## SCIENTIFIC COMMUNITY

Supervision of undergrad students in France and in the USA

Since 2010, Reviewer for *European Journal of Neuroscience*, *Neuropsychologia*, *Brain Topography*, *Brain Stimulation*, *Journal of Neural Transmission*, *Frontiers in Human Neuroscience*, *Frontiers in Integrative Neuroscience*, *Frontiers in Psychology*, *Psychophysiology*, *PlosOne*

Co-organization of a Day on Neuroscience, Aesthetics and Complexity in Paris (October 2013)

Co-organization of the National (French) Eye Movement Day in Paris (September 2009)

## LANGUAGES

French	Native
English	Fluent (post-docs in the USA)
Portuguese	High written and spoken level (6 months in Brazil)

## GRANTS

2013	Awarded a research fellowship by the Medical Research Foundation
2010	Awarded a research fellowship by the Fyssen Foundation
2006	Awarded a PhD-student fellowship by the University Paris 6
2006	Awarded a research fellowship by the Garches Foundation
2005	Awarded a university fellowship during master 2 of Cognitive Sciences

## WORKSHOPS ATTENDANCE

Summer 2017	<b>Scientists Teaching Science.</b> 9 weeks, NIH, Bethesda MD, USA
March 2017	<b>Open and reproducible neuroscience.</b> 2 days, NIH, Bethesda MD, USA
Feb 2016	<b>AFNI bootcamp.</b> 1 week, NIH, Bethesda MD, USA
Fall 2015	<b>Principles of fMRI.</b> 8 weeks, Johns Hopkins University, Coursera
Fall 2015	<b>An introduction to interactive programming in Python.</b> 8 weeks, Rice University, Coursera
Sept 2014	<b>Connectomics.</b> 1 week, CNRS & Bordeaux University, France
Sept 2013	<b>The Visceral Mind Summer School.</b> 1 week, Bangor University, Wales, UK
June 2013	<b>TMS-EEG Summer School.</b> 1 week, Aalto University school of Science, Helsinki, Finland
Fall 2012	<b>Machine Learning.</b> 10 weeks, Stanford University, online course, Coursera
April 2012	<b>Expanding Cross-Disciplinary Dialogue.</b> 2 days, National Postdoctoral Association, Washington DC
Aug 2012	<b>Dynamic Causal Modeling (DCM) workshop.</b> 2 days, ICM, Paris, France
Nov 2010	<b>EEGLab workshop.</b> 1 week, San Diego Supercomputer Center, UCSD, La Jolla CA, USA
2007	<b>Management workshops.</b> 9 days, PhD Formation Institute, Paris 6 University and United Partners

## PUBLICATIONS

1. **Vernet M**, Japee S, Lokey S, Ahmed S, Zachariou V, Ungerleider LG (in press). *Endogenous visuospatial attention increases visual awareness independent of visual discrimination sensitivity*. *Neuropsychologia*
2. **Amengual JL, Vernet M (co-first author)**, Adam C, Valero-Cabré A (2017). *Local entrainment of oscillatory activity induced by direct brain stimulation in humans*. *Scientific Report*. 7:41908 (IF: 5.5)
3. Farzan F, **Vernet M**, Shafi M, Rotenberg A, Daskalakis ZJ, Pascual-Leone A (2016). *Characterizing and modulating brain circuitry through transcranial magnetic stimulation combined with electroencephalography*. *Frontiers in Neural Circuits*. 10:73
4. Teichmann M, Lesoil C, Godard J, **Vernet M**, Bertrand A, Levy R, Dubois B, Lemoine L, Truong DQ, Bikson M, Kas A, Valero-Cabré A. (2016) *Direct current stimulation over the anterior temporal areas boosts semantic processing in primary aphasia*. *Annals of Neurology*. 80(5):693-707 (IF: 9.6)
5. Bashir S, **Vernet M**, Najib U, Perez J, Alonso-Alonso M, Knobel M, Yoo WK, Edwards D, Pascual-Leone A1 (2016). *Enhanced motor function and its neurophysiological correlates after navigated low-frequency repetitive transcranial magnetic stimulation over the contralesional motor cortex in stroke*. *Restorative Neurology and Neuroscience*. 11;34(4):677-89
6. Kapoula Z, Ruiz S, Spector L, Mocoovi M, Gaertner C, Quilici C, **Vernet M**. (2016). *Education influences creativity in dyslexic and non-dyslexic children and teenagers*. *PlosOne*. 11(3)1-14 (IF: 3.2)
7. Quentin R, Elkin Frankston S, **Vernet M**, Toba M, Bartolomeo P, Chanes L, Valero-Cabré A. (2016) *Visual contrast sensitivity improvement by right frontal activity is mediated by contrast gain mechanisms and influenced by fronto-parietal white matter microstructure*. *Cerebral Cortex*. 26(6):2381-90 (IF: 8.3)
8. Quentin R, Chanes L, **Vernet M**, Valero-Cabré A. (2015) *Fronto-parietal anatomical connections influence the modulation of conscious visual perception by high-beta frontal oscillatory activity*. *Cerebral Cortex*. 25(8):2095-101 (IF: 8.3)
9. Shafi M, **Vernet M**, Klooster D, Barnard M, Romatoski K, Westover M, Christodoulou J, Gabrieli J, Whitfield-Gabrieli S, Pascual-Leone A, Chang B. (2015) *Physiological consequences of abnormal connectivity in a developmental epilepsy*. *Annals of Neurology*. 77(3):487-503 (IF: 11.9)
10. **Tremblay S, Vernet M (co-first author)**, Bashir S, Pascual-Leone A, Théoret H. (2015) *Theta burst stimulation to characterize changes in brain plasticity following mild traumatic brain injury: a proof-of-principle study*. *Restorative Neurology and Neuroscience*. 33(5):611-20 (IF: 2.5)
11. **Vernet M**, Brem AK, Farzan F, Pascual-Leone A. (2015) *Synchronous and opposite roles of the parietal and prefrontal cortices in bistable perception: a double-coil TMS-EEG study*. *Cortex*. 64C: 78-88 (IF: 5.1)
12. Kapoula Z, Lang A, **Vernet M**, Locher P. (2015) *Eye movement instructions modulate motion illusion and body sway with Op Art*. *Frontiers in Human Neuroscience*. 9:121 (IF: 2.5)
13. Chanes L, Quentin R, **Vernet M**, Valero-Cabré A. (2015) *Arrhythmic activity in the left frontal eye field facilitates conscious visual perception in humans*. *Cortex*. 71:240-7 (IF: 5.1)
14. **Vernet M**, Quentin R, Chanes L, Mitsumasu MA, Valero-Cabré A. (2014) *Frontal Eye Field, Where Art Thou? Anatomy, physiology and non-invasive manipulation of frontal regions involved in eye movements in 3D space and associated cognitive operations*. *Frontiers in Integrative Neuroscience*. 8(66): 1-24
15. Kapoula Z, Lang A, Lê TT, Adenis MS, Yang Q, Lipede G, **Vernet M**. (2014) *Visiting Richard Serra's "Promenade" sculpture improves postural control and judgment of subjective visual vertical*. *Frontiers in Psychology*. 5: 1349 (IF: 2.8)
16. Bashir S, Perez JM, Horvath JC, Pena-Gomez C, **Vernet M**, Capia A, Alonso-Alonso M and Pascual-Leone A. (2014) *Differential effects of motor cortical excitability and plasticity in young and old individuals: a Transcranial Magnetic Stimulation (TMS) study*. *Frontiers in Aging Neuroscience*. 6(111): 1-13 (IF: 5.2)
17. **Vernet M**, Bashir S, Yoo WK, Oberman L, Mizrahi I, Ifier-Miller F, Beck CJ, Pascual-Leone A. (2014) *Reproducibility of the effects of theta burst stimulation on motor cortical plasticity in healthy participants*. *Clinical Neurophysiology*. 125(2): 320-6 (IF: 3.1)
18. **Vernet M**, Bashir S, Yoo WK, Perez JM, Najib U, Pascual-Leone A. (2013) *Insights on the neural basis of motor plasticity induced by theta burst stimulation from TMS-EEG*. *European Journal of Neuroscience*. 37(4):598-606 (IF: 3.8)
19. Valero-Cabré A, Quentin R, **Vernet M**, Chanes L (2013). *Author response. Oscillation and synchrony entrainment: a new breadth for focal non-invasive neurostimulation in the cognitive neurosciences*. *Journal of Neuroscience*. 33(28):5 p following 11326 (IF: 6.9)
20. Lang A, **Vernet M**, Yang Q, Orssaud C, Londero A, Kapoula Z. (2013) *Differential auditory-oculomotor interactions in patients with right vs. left sided subjective tinnitus: a saccade study*. *Frontiers in Human Neuroscience*. 7(47): 1-10 (IF: 2.5)
21. Pereira AC, Schomer A, Feng W, Najib U, Yoo WK, **Vernet M**, Alexander MP, Caplan LR, Pascual-Leone A. (2012) *The anterior*

- disconnection syndrome revisited using modern technologies*. Neurology. 79(3): 290-1 (IF: 8.2)
22. **Vernet M**, Walker L, Yoo WK, Pascual-Leone A, Chang BS. (2012) *EEG onset of a seizure during TMS from a focus independent of the stimulation site*. Clinical Neurophysiology. 123(10):2106-8 (IF: 3.1)
  23. **Bashir S, Vernet M (co-first author)**, Yoo WK, Mizrahi I, Theoret H, Pascual-Leone A. (2012) *Changes in cortical plasticity after mild traumatic brain injury*. Restorative Neurology and Neuroscience. 30(4):277-82. (IF: 2.9)
  24. Freitas C, Perez J, Knobel M, Tormos JM, Oberman LM, Eldaief M, Bashir S, **Vernet M**, Peña-Gómez C, Pascual-Leone A. (2011) *Changes in cortical plasticity across the lifespan*. Frontiers in Aging Neuroscience. 3: 1-5 (IF: 5.2)
  25. Pascual-Leone A, Freitas C, Oberman L, Horvath JC, Halko M, Eldaief M, Bashir S, **Vernet M**, Shafi M, Westover B, Vahabzadeh-Hagh AM, Rotenberg A. (2011) *Characterizing Brain Cortical Plasticity and Network Dynamics Across the Age-Span in Health and Disease with TMS-EEG and TMS-fMRI*. Brain Topography. 24(3-4):302-15 (IF: 3.7)
  26. **Vernet M**, Yang Q, Kapoula Z. (2011) *Guiding binocular saccades during reading: a TMS study of the PPC*. Frontiers in Human Neuroscience. 5(14): 1-8 (IF: 2.9)
  27. Jainta S, **Vernet M**, Yang Q, Kapoula Z. (2011) *The pupil reflects motor preparation for saccades - even before the eye starts to move*. Frontiers in Human Neuroscience. 5: 1-10 (IF: 2.5)
  28. Kapoula Z, Yang Q, Sabbah N, **Vernet M**. (2011) *Different effects of double-pulse TMS of the posterior parietal cortex on reflexive and voluntary saccades*. Frontiers in Human Neuroscience. 5: 1-9 (IF: 2.5)
  29. Kapoula Z, Yang Q, Lê TT, **Vernet M**, Berbey, N, Orssaud C, Londero A, Bonfils P. (2011) *Medio-lateral postural instability in subjects with tinnitus*. Frontiers in Neurology. 2(35):1-8
  30. Yang Q, **Vernet M**, Bucci MP, Kapoula Z. (2010) *Binocular coordination during smooth pursuit in dyslexia: a multiple case study*. Journal of Eye Movement Research. 3(3): 1-8
  31. Kapoula Z, Yang Q, **Vernet M**, Bonfils P, Londero A. (2010) *Eye movement abnormalities in somatic tinnitus: Fixation, smooth pursuit and optokinetic nystagmus*. Auris Nasus Larynx. 37(3): 314-21
  32. Yang Q, **Vernet M**, Orssaud C, Bonfils P, Londero A, Kapoula Z. (2010) *Central crosstalk for somatic tinnitus: abnormal vergence eye movements*. PlosOne. 5(7): 1-11 (IF: 3.7)
  33. Kapoula Z, Yang Q, **Vernet M**, Dieudonne B, Greffard S, Verny M. (2010) *Spread deficits in initiation, speed and accuracy of horizontal and vertical automatic saccades in dementia with Lewy bodies*. Frontiers in Neurology. 1(138): 1-10
  34. Kapoula Z, Yang Q, **Vernet M**, Orssaud C, Samson M, Dieudonne B, Greffard S, Verny M. (2010) *[Preservation of automatic ocular saccades in healthy elderly: alteration in patients with dementia with Lewy body]*. Psychologie & NeuroPsychiatrie du Vieillissement. 8(4): 295-306
  35. **Vernet M**, Kapoula Z. (2009) *Binocular motor coordination during saccades and fixation while reading: a magnitude and time analysis*. Journal of vision. 9(7): 1-13 (IF: 2.5)
  36. **Vernet M**, Yang Q, Gruselle M, Trams M, Kapoula Z. (2009) *Switching between gap and overlap pro-saccades: cost or benefit?* Experimental Brain Research. 197: 49-58 (IF: 2.2)
  37. Kapoula Z, Yang Q, **Vernet M**, Bucci MP. (2009) *Eye movements and pictorial space perception: studies of paintings from Francis Bacon and Piero della Francesca*. Cognitive Semiotics. 5(Fall 2009)
  38. Bucci MP, **Vernet M**, Gerard CL, Kapoula Z. (2009) *Normal speed and accuracy of saccade and vergence eye movements in dyslexic reader children*. Journal of Ophthalmology. DOI:10.1155/2009/325214
  39. **Vernet M**, Yang Q, Daunys G, Orssaud C, Eggert T, Kapoula Z. (2008) *How the brain obeys Hering's law: a TMS study of the posterior parietal cortex*. Investigative Ophthalmology and Visual Science. 49(1): 230-7 (IF: 3.4)
  40. Kapoula Z, **Vernet M**, Yang Q, Bucci MP. (2008) *Binocular coordination of saccades: development, aging and cerebral substrate*. Journal of Eye Movement Research. 2(3):3: 1-20
  41. **Vernet M**, Yang Q, Daunys G, Orssaud C, Kapoula Z. (2008) *TMS of PPC delays saccades but not when they are combined with predictable divergence*. Brain Research Bulletin. 76(1-2): 50-6
  42. **Vernet M**, Yang Q, Daunys G, Orssaud C, Kapoula Z. (2008) *Divergence influences triggering of both vertical and horizontal saccades*. Optometry and Vision Science. 85(3): 187-95
  43. Nadrigny F, Rivals I, Hirrlinger PG, Koulakoff A, Personnaz L, **Vernet M**, Allieux M, Chaumeil M, Ropert N, Giaume C, Kirchhoff F, Oheim M. (2006) *Detecting fluorescent protein expression and co-localisation on single secretory vesicles with linear spectral unmixing*. European Biophysics Journal. 35(6): 533-47

## BOOK CHAPTERS

1. **Vernet M.** (2016) *How Art and Neuroscience fell for each other*. In Kapoula Z, **Vernet M** (Eds), *Aesthetics and Neuroscience*
2. Kapoula Z, **Vernet M.** (2016) *Dyslexia, Education and Creativity, a Cross-Cultural Study*. In Kapoula Z, **Vernet M** (Eds), *Aesthetics and Neuroscience*
3. **Vernet M,** Thut G. (2014) *Electroencephalography during Transcranial Magnetic Stimulation: current modus operandi*. In Pascual-Leone A, Horvath JC, Rotenberg A (Eds), *Neuromethods: Transcranial Magnetic Stimulation*
4. **Vernet M,** Bashir S, Enam SF, Kumru H, Pascual-Leone A. (2012) *Traumatic Brain Injury: Electrophysiological techniques*. In: Zasler N, Zafonte R, Katz D (Eds), *Brain injury medicine: principles and practice*

## BOOK (Editor)

Kapoula Z, **Vernet M** (Eds), 2016, *Aesthetics and Neuroscience*. Springer

## Ph.D. THESIS (in French)

- Freely accessible in <https://tel.archives-ouvertes.fr/tel-00459341v1>. *Coordination des Mouvements Oculaires dans l'Espace 3D chez l'Homme : substrat Cortical Étudié par TMS*
- Manuscript also published (Editions Universitaires Européennes): *Comment se coordonnent nos yeux lorsque nous explorons l'espace 3D. Substrat cortical étudié par stimulation magnétique transcrânienne*

## CONFERENCES (with first-author posters/oral presentations)

- Nov. 2017 **SfN**: Annual meeting of the Society for Neurosciences in Washington DC, USA (**talk**)
- March 2017 **CNS**: Annual Meeting of the Cognitive Neuroscience Society in San Francisco CA, USA
- Nov. 2016 **SfN**: Annual meeting of the Society for Neurosciences in San Diego CA, USA
- Sept. 2015 **Cutting EEG (II)**: Cutting-edge methods for EEG research on cognition, Berlin, Germany (**invited talk**)
- June 2015 **OHBM**: Annual Meeting of the Organization for Human Brain Mapping in Honolulu HI, USA
- Nov. 2014 **SfN**: Annual meeting of the Society for Neurosciences in Washington DC, MA
- April 2014 **CNS**: Annual Meeting of the Cognitive Neuroscience Society in Boston, Massachusetts, USA
- June 2011 **OHBM**: Annual Meeting of the Organization for Human Brain Mapping in Quebec City, Canada
- May 2011 **VSS**: Annual meeting of the Vision Science Society in Naples, FL, USA
- August 2009 **ECEM**: European conference on eye movements in Southampton, UK (**talk**)
- Nov. 2008 **SfN**: Annual meeting of the Society for Neurosciences in Washington DC, USA (**talk**)
- August 2007 **ECEM**: European conference on eye movements in Postdam, Germany (**talk**)