

Victor J. Barrès, PhD

Computational Neuroscience | Language Processing | Artificial Intelligence

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SKILLS

PROGRAMMING	• Python (Advanced), Matlab-Simulink (Advanced), C/C++ (intermediary), SQL (basic), AWS (basic), Unix, Git.
TECHNIQUES	• Brain modeling (neural networks, hybrid systems, symbolic A.I.), Computational linguistics, NLP, Machine learning. • Experiment design and analysis. • Scientific writing (peer reviewed papers, reports, LaTeX), Scientific presentation.
EXPERTISE	Neuro-cognitive modeling, Neural networks, Dynamical systems, Computational neurolinguistics, Dynamics of language-vision interactions, Computational construction grammar, Visual attention, Cognitive linguistics.

EDUCATION

PhD in Neuroscience (computational neuroscience) – University of Southern California, CA, USA	August 2017
MS in Cognitive Science – Ecole Normale Supérieure, France	June 2010
MS in Physics – Ecole Polytechnique, France	August 2006
BS in Mathematics and Physics – Lycee Louis le Grand, France	August 2003

WORK EXPERIENCE

DOCTORAL RESEARCHER, COMPUTATIONAL NEUROSCIENCE USC Brain Project & Action Brain Language Evolution group (ABLE) – UNIVERSITY OF SOUTHERN CALIFORNIA, CA. • Developed and implemented SALVIA, a novel computational cognitive level model accounting for the dynamic coordinated interplay between visual attention, language processing, and inference during scene descriptions' production and comprehension . • Developed and implemented Template Construction Grammar, a novel computational construction grammar framework. Ongoing collaborations to compare formalisms with the Fluid Construction Grammar group at Sony CSL Paris and the Robot Cognition Lab at INSERM, France. • Advanced Schema Theory as a Brain Theory model of distributed hybrid computation in a system-of-systems architecture structured according to cognitive (neuroscience) data, where symbolic operations are governed by dynamic cooperative computation • Co-organized and participated in 3 NSF founded Action Brain Language and Evolution (ABLE) workshops bringing together researchers from neuroscience, computer science, linguistics, and primatology in order to foster trans-disciplinary exchanges furthering the research on language evolution. • Teaching Assistant for Brain Theory and Artificial Intelligence (CS 564) and Applied Natural Language Processing (CS 544).	Sept 10 – Aug 17
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RESEARCH ASSISTANT

Laboratory of Physiology of Perception and Action (LPPA) – COLLEGE DE FRANCE, PARIS, FRANCE. • Designed, ran, analyzed and published a set of novel psychophysics experiments on the perception of multi-modal, multi-stable stimuli. (Head mounted VR display, experiment coded in Virtools & C, analysis in Matlab & Excel).	Sept 09 – June 10
Gazzaley lab – UNIVERSITY OF CALIFORNIA SAN FRANCISCO, CA. • Daily ran anatomical and functional MRI scans, EEG recording, motion capture guided TMS (based on anatomical scans). EEG ERP analysis. Experiment design (Matlab, Psychtoolbox).	June 09 – Aug 09

SELECTED PUBLICATIONS

- Barrès, V.** (2017) *Schema Architecture for Language Vision InterActions: A Computational Cognitive Neuroscience Model of Language Use*. (Doctoral Dissertation)
- Barrès, V.** (2017) *Template Construction Grammar: A Schema-Theoretic Computational Construction Grammar*. In 2017 AAAI Spring Symposium Series.
- Arbib, M. A., Gasser, B., & **Barrès, V.** (2014). *Language is handy but is it embodied?* *Neuropsychologia*, 55, 57-70.
- Barrès, V.**, Lee, J. (2014). *Template Construction Grammar: from visual scene description to language comprehension and agrammatism*. *Neuroinformatics*, 1-28.
- Barrès, V.**, Simons III, A., & Arbib, M. A. (2013). *Synthetic event-related potentials: A computational bridge between neurolinguistic models and experiments*. *Neural Networks*, 37, 66-92.

SELECTED TALKS

- Barrès, V.** (2017) *Template Construction Grammar: A Schema-Theoretic Computational Construction Grammar*. AAAI Spring Symposium Series.
- Barrès, V.** (2017) *Description of visual scenes as well as sentence comprehension, using the Schema Architecture Language-Vision InterAction (SALVIA) cognitive model*. Center for Research in Language Talk. UCSD
- Barrès, V.** (2014) *Template Construction Grammar: Neuro-Computational Modeling of the Vision-Language Interface*. Cluster of Excellence Cognitive Interaction Technology (CITEC), Germany.

HONORS & AWARDS

University of Southern California Final Year Dissertation Fellowship.	2016 – 2017
University of Southern California Provost's Ph.D. Fellowship.	2010 – 2014