

Victor J. Barrès, PhD

Brain, Language, and Computation

3623 BROOK STREET, LAFAYETTE, CA 94549, USA

☎ (+1) 323-599-7019 | ✉ victor.barrès@gmail.com | 🌐 www.victorbarres.com | 📺 victorbarres | 📺 victor-barres-35349a73

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 SUPERIEURE, 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 Sept 10 – Aug 17

USC Brain Project & Action Brain Language Evolution group (ABLE) – UNIVERSITY OF SOUTHERN CALIFORNIA, CA.

- Development of an implemented computational cognitive level Schema Architecture for Language-Vision InterActions (SALVIA) model accounting for the **dynamic coordinated interplay between visual attention, language processing, and inference** during **scene descriptions' production and comprehension**.
- Development of a **novel implemented computational construction grammar** (CCxG) framework Template Construction Grammar (TCG). In depth comparisons of the theoretical and computational assumptions made by the four major CCxG frameworks (Steel's FCG at Sony CSL Paris, Feldman's ECG at Berkeley, Dominey's DCG at CNRS).
- Advancing **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, developing the COgnitive Architecture Schema Theory (COAST) python library.
- Co-organizing and participating in **3 NSF funded 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 Jan, 13 – June 16

Department of Computer Science, UNIVERSITY OF SOUTHERN CALIFORNIA, CA

- **Brain Theory and Artificial Intelligence** (CS 564), **Applied Natural Language Processing** (CS 544).

Research Assistant

Laboratory of Physiology of Perception and Action (LPPA) – COLLEGE DE FRANCE, PARIS, FRANCE. Sept 09 – June 10

- Designed, ran, analyzed and published a set of psychophysics experiments on the perception of multi-modal, multi-stable stimuli. (Head mounted VR display, experiment coded in Virtools & C, analysis in Matlab & Excel).

Gazzaley lab – UNIVERSITY OF CALIFORNIA SAN FRANCISCO, CA. June 09 – Aug 09

- Daily ran anatomical and functional MRI scans, EEG recording, motion capture guided TMS (based on anatomical scans). EEG ERP analysis. Experiment design (Matlab, Psychtoolbox).

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