jesús calvillo

Postdoctoral Researcher in Computational (Psycho-)linguistics

contact

Fleher Str. 27
40223, Düsseldorf
Germany

+49 15237398563

jescalvillot@gmail.com

languages

Spanish (native)
English (advanced)
German
(Goethe C1, advanced)
French
(B1, intermediate)

programming

Python, Java
Perl, Bash
HTML, CSS, JavaScript

operating systems

Linux, Windows
Mac OS

education

2014-2019   **PhD in Computational Linguistics and Psycholinguistics**   Saarland University, Germany
Dissertation focused on modeling human language production using artificial recurrent neural networks and with emphasis on information theory and distributed semantic representations.

2011–2013   **MSc in Language Science and Technology**   Saarland University, Germany
Thesis: A Rational Statistical Parser
Implementation of a rational model of syntactic parsing, exploring the role of entropy for syntactic disambiguation.

2004–2009   **BSc in Computer Engineering**   Technological Institute of Morelia, Mexico
Specialization in Software Engineering

experience

2021–   **Heinrich Heine Universität Düsseldorf**   Düsseldorf, Germany
Postdoctoral Researcher
Development of models of human event and sentence processing using artificial neural networks. The models are intended to reproduce the mapping of sentences to semantic representations (language comprehension) and vice versa (language production), with a focus on temporal and aspectual phenomena.

2018–2020   **Penn State Applied Cognitive Science Lab**   State College, PA, USA
Postdoctoral Researcher
Development of psychologically plausible models of human language processing, and Natural Language Processing applications. Projects were related to discourse analysis of classroom dialogue, explainable AI, and psycholinguistic analysis of Chinese-English code-switching.

2013–2015   **German Research Center for Artificial Intelligence (DFKI)**   Saarbrücken, Germany
Research Assistant: Java Development for NLP
Developed a Java application for Argumentation Mining. This was designed from scratch integrating several NLP systems, including pos-tagging, named entity recognition and lemmatization. With these features, an information retrieval system was developed that considers thematic and argumentative patterns during search.

2012   **Cluster of Excellence: Multimodal Computing and Interaction**   Saarbrücken, Germany
Research Assistant: Python Development for Psycholinguistics
Developed a Python tool interfacing with the Stanford Parser in order to generate psycholinguistic measures of word complexity: Integration and Storage costs, in order to test the correlation between these psycholinguistic measures and fixation times of eye-tracking experimental data.

| 2011 | **IBM** | Guadalajara, Mexico |

Programmer and System Administrator
Developed a Perl-JavaScript tool to generate performance web reports from log files of storage servers. My area provided technical support to massive storage servers by performing forensic analysis on the log data sent by the customers, as well as System Administration tasks. The developed tool provides graphics and statistics that enable a fast performance analysis and problem resolution.

| 2009–2011 | **DomainGurus** | Morelia, Mexico |

System Administrator
Technical Support for 3 datacenters in San Diego, California. The support was mainly done remotely, with trainings in San Diego every 2/3 months. The servers were mainly Linux and Windows, and some FreeBSD and 3Tera Applogic. The tasks were related to connectivity, databases, web programming, DNS, virtualization, web and mail servers, and cloud computing.

teaching

2018–2019 **Thesis Advisor: Le Fang (BSc in Information Science and Technology)**
Pennsylvania State University, USA

2013–2018 **T.A. Computational Psycholinguistics**
Saarland University, Germany

2016 **T.A. Connectionist Language Processing**
Saarland University, Germany

2015 **T.A. Mathematical Foundations for Computational Linguistics III**
Saarland University, Germany

2015, 2017 **T.A. Information Theory for Computational Linguistics**
Saarland University, Germany

2013 **Block course on Computational Linguistics**
Technological Institute of Morelia, Mexico

awards and certifications

| **2011–2018** | **Postgraduate Scholarship** | National Council of Science and Technology, Mexico |

Scholarship for master and phd studies

| **2009** | **Premio Padre de la Patria** | University of Michoacan, Mexico |

Best grades in the Languages Department for English, French and German

| **2009** | **Certification: 3Tera Cloud Architect** | 3Tera, Washington D.C., USA |

Cloud and Grid Computing

interests

professional: computational psycholinguistics and linguistics, natural language processing, deep learning, explainable AI, cognitive science, machine learning, neural networks, syntax, semantics, information theory, artificial intelligence.

personal: swimming, literature, cooking, films, trips.

publications

Semantic Systematicity in Connectionist Language Production
Calvillo, J.; Brouwer, H., and Crocker, M. W.
Information *12.8 (2021) p. 329. Multidisciplinary Digital Publishing Institute, 2021*

Surprisal Predicts Code-Switching in Chinese-English Bilingual Text
Calvillo, J.; Fang, L.; Cole, J., and Reitter, D.
Proceedings of the Conference on Empirical Methods in Natural Language Processing, 2020

Teachers Learning to Promote Classroom Discourse, Equity, Agency, and Engagement
Hall, A.; Nathan, M.; Swart, M.; Fitzpatrick, S.; Dolezalek, B.; Correnti, R.; Witherspoon, E.; Matsumura, L. C.; Walsh, M.; Schunn, C., et al.
(2020). International Society of the Learning Sciences (ISLS), 2020

Which Sentence Embeddings and Which Layers Encode Syntactic Structure?
Kelly, M. A.; Xu, Y.; Calvillo, J., and Reitter, D.
Proceedings of the 42nd Annual Conference of the Cognitive Science Society, Austin, TX: Cognitive Science Society, 2020

Connectionist Language Production: Distributed Representations and the Uniform Information Density Hypothesis
Calvillo, J.
Saarland University, PhD Dissertation, 2019, http://dx.doi.org/10.22028/D291-27934

Language Production Dynamics with Recurrent Neural Networks
Calvillo, J. and Crocker, M.
Proceedings of the Eight Workshop on Cognitive Aspects of Computational Language Learning and Processing, 2018

Fast and Easy: Approximating Uniform Information Density in Language Production
Calvillo, J.
Proceedings of the 39th Annual Conference of the Cognitive Science Society, Austin, TX: Cognitive Science Society, 2017

Connectionist Semantic Systematicity in Language Production
Calvillo, J.; Brouwer, H., and Crocker, M. W.
Proceedings of the 38th Annual Conference of the Cognitive Science Society, Austin, TX: Cognitive Science Society, 2016

Konzeption und Implementierung eines Werkzeuges zur automatisierten Identifikation und Analyse von Argumentationsstrukturen anhand der Entscheidungen des Bundesverfassungsgerichts im Digital-Humanities-Projekt ARGUMENTUM
Houy, C.; Niesen, T.; Calvillo, J.; Fettke, P.; Loos, P.; Krämer, A.; Schmidt, K.; Herberger, M.; Speiser, I.; Gass, A.; Schneider, L., and Philippi, T.
Datenbank-Spektrum (2015) pp. 1–9. Springer Berlin Heidelberg, 2015

A Rational Statistical Parser
Calvillo, J. and Crocker, M.
Proceedings of Natural Language Processing and Cognitive Science NLPCS 2014, 2014, Venice, Italy

Konzept und Architektur eines Software-Werkzeuges zur automatisierten Identifikation und Analyse von Argumentationsstrukturen
Houy, C.; Niesen, T.; Calvillo, J.; Fettke, P., and Loos, P.
Gemeinsam Electronic Government (ziel)gruppengerecht gestalten und organisieren, 2014