Afra Alishahi – Curriculum Vitae

| CONTACT INFORMATION | Department of Cognitive Science and AI
School of Humanities and Digital Sciences
Tilburg University | *Email:*
Phone:
Webpage: | A.Alishahi@tilburguniversity.edu
+31 (612) 196 483
http://afra.alishahi.name/ |

PROFESSIONAL POSITIONS

Associate Professor, Department of Cognitive Science and Artificial Intelligence, Tilburg University, The Netherlands, (2014–present)

Assistant Professor, Department of Cognitive Science and Artificial Intelligence, Tilburg University, The Netherlands, (2011–2014)

Postdoctoral fellow, Computational Psycholinguistics group, Department of Computational Linguistics and Phonetics, Saarland University, Saarbrücken, Germany (2008–2011)

EDUCATION

PhD, 2008   **University of Toronto**, Toronto, Canada
Computer Science

M.S., 1998   **Tehran University**, Tehran, Iran
Computer Engineering

B.S., 1994   **Sharif University of Technology**, Tehran, Iran
Computer Engineering

RESEARCH INTERESTS

Computational models of human language
Grounded, multi-modal language learning
Analyzing and interpreting neural networks
Language and interaction

GRANTS AND AWARDS

Recipient of Dutch National Research Agenda (NWA-ORC 2019), 2020.

Recipient of the NWO e-Science grant as part of the Accelerating Scientific Discovery (ASDI) initiative (with Grzegorz Chrupała), 2018.

Recipient of the NWO Aspasia grant, 2015.

Recipient of the NWO Natural Artificial Intelligence grant for the project Learning to Communicate via Social and Linguistic Interactions (with Paul Vogt and Emiel Krahmer), 2015.

Winner of the **Best Paper Award**, the 21st Conference on Natural Language Learning (with Marie Barking and Grzegorz Chrupala), 2017.

Winner of the **Cognitive Science Prize** for the best paper on Language Modeling, the 30th Annual Conference of the Cognitive Science Society, 2008 (with Afsaneh Fazly and Suzanne Stevenson), 2008.

Runner-up for **Marr Prize** for the best student paper, the 27th Annual Conference of the Cognitive Science Society, 2005.

Publications

JOURNAL ARTICLES

Afra Alishahi, Grzegorz Chrupała and Tal Linzen (2019). Analyzing and Interpreting Neural Networks for NLP: A Report on the First BlackboxNLP Workshop. *Natural Language Engineering*, 25(4), 543-557.

Ákos Kádár, Grzegorz Chrupała and **Afra Alishahi** (2017). Representation of linguistic form and function in recurrent neural networks. *Computational Linguistics*, 43(4), 761–780.

Yevgen Matusevych, **Afra Alishahi** and Ad Backus (2017). The impact of first and second language exposure on learning second language constructions. *Bilingualism: Language and Cognition*, 20(1), 128–149.

Yeven Matusevych, **Afra Alishahi** and Ad Backus (2017). Quantifying cross-linguistic influence with a computational model: A study of case-marking comprehension. *Linguistic Approaches to Bilingualism*. Advance online publication. DOI: 10.1075/lab.16038.mat.

Yeven Matusevych, **Afra Alishahi** and Ad Backus (2016). Modeling verb selection within argument structure constructions. *Language, Cognition and Neuroscience*, 31(10), 1215–1244.

Ákos Kádár, Grzegorz Chrupała, **Afra Alishahi** (2016). Learning word meanings from images of natural scenes. *Traitement Automatique des Langues (TAL)*, Special Issue on "Natural Language Processing and Cognition".

Afra Alishahi (2014). Lifecycle of a probabilistic constructions. *Theoretical Linguistics*, 40:1-2, 77–88.

Eva van den Bemd, Maria Mos and **Afra Alishahi** (2014). Does sentence structure boost early word learning? An artificial language learning study. *Wiener Linguistische Gazette*, Issue 78A.

Afra Alishahi, Afsaneh Fazly, Judith Koehne and Matthew Crocker (2012). Sentence-based attentional mechanisms in word learning: Evidence from a computational model. *Frontiers in Developmental Psychology*, 3:200.

Afra Alishahi and Suzanne Stevenson (2010). A computational model of learning semantic roles from child-directed language. *Language and Cognitive Processes*, 25:1, 50–93.

Afsaneh Fazly, **Afra Alishahi** and Suzanne Stevenson (2010). A probabilistic computational model of cross-situational word learning. *Cognitive Science*, 34:6, 1017–1063

Afra Alishahi and Suzanne Stevenson (2008). A computational model for early argument structure acquisition. *Cognitive Science*, 32:5, 789–834.

REFEREED CONFERENCE PROCEEDINGS

Grzegorz Chrupała, Bertrand Higy and **Afra Alishahi** (2020). Analyzing analytical methods: The case of phonology in neural models of spoken language. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL)*.

Lieke Gelderloos, Grzegorz Chrupała and **Afra Alishahi** (2020). Learning to understand child- and adult-directed speech. In *Proceedings of the 58th Annual Meeting of the Associ-*

ation for Computational Linguistics (ACL).

Lieke Gelderloos, Alireza M. Kamelabad and Afra Alishahi (2020). Active Word Learning through Self-supervision. In *Proceedings of the 42nd Annual Conference of the Cognitive Science Society (CogSci).*

Grzegorz Chrupała and **Afra Alishahi** (2019). Correlating neural and symbolic representations of language. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL).*

Daan Keijser, Lieke Gelderloos and **Afra Alishahi** (2019). Curious topics: a curiosity-based model of first language word learning. In *Proceedings of the 41st Annual Conference of the Cognitive Science Society (CogSci)*, Montreal, Canada.

Grzegorz Chrupała, Lieke Gelderloos, Ákos Kádár and **Afra Alishahi** (2019). On the difficulty of a distributional semantics of spoken language. In *Proceedings of the Society for Computation in Linguistics (SCiL).*

Tal Linzen, Grzegorz Chrupała and **Afra Alishahi**, editors (2018). Proceedings of the Workshop: Analyzing and Interpreting Neural Networks for NLP, BlackboxNLP at EMNLP 2018, Brussels, Belgium. Association for Computational Linguistics.

Ákos Kádár, Desmond Elliott, Marc-Alexandre Côté, Grzegorz Chrupała and **Afra Alishahi** (2018). Lessons learned in multilingual grounded language learning. In *Proceedings of Conference on Computational Natural Language Learning (CoNLL).*

Ákos Kádár, Marc-Alexandre Côté, Grzegorz Chrupała and **Afra Alishahi** (2018). Revisiting the Hierarchical Multiscale LSTM. In *Proceedings of the Conference on Computational Linguistics (COLING).*

Afra Alishahi, Marie Barking and Grzegorz Chrupała (2017). Encoding of phonology in a recurrent neural model of grounded speech. In *Proceedings of Conference on Computational Natural Language Learning (CoNLL).*

Grzegorz Chrupała, Lieke Gelderloos and **Afra Alishahi** (2017). Representations of language in a model of visually grounded speech signal. In *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL).*

Moinuddin M. Haque, Paul Vogt, **Afra Alishahi** and Emiel Krahmer (2016). A connectionist model for automatic generation of child-adult interaction patterns. In *Proceedings of the 38th Annual Conference of the Cognitive Science Society*, Philadelphia, Pennsylvania.

Grzegorz Chrupała, Ákos Kádár and **Afra Alishahi** (2015). Learning language through pictures. In *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL).*

Yevgen Matusevych, **Afra Alishahi** and Ad Backus (2015). Distributional determinants of learning argument structure constructions in first and second language. In *Proceedings of the 37th Annual Conference of the Cognitive Science Society*, Pasadena, USA

Yevgen Matusevych, **Afra Alishahi** and Ad Backus (2014). Isolating second language acquisition factors: A computational model of bilingual construction learning. In *Proceedings of the 36th Annual Conference of the Cognitive Science Society*, Quebec City, Canada.

Yevgen Matusevych, **Afra Alishahi** and Paul Vogt (2013). Automatic generation of naturalistic child-adult interaction data. *Proceedings of the 35th Annual Conference of the Cognitive Science Society*, Berlin, Germany.

Afra Alishahi and Grzegorz Chrupała (2012). Concurrent acquisition of word meaning and lexical categories. *Proceedings of the 2012 Conference on Empirical Methods on Natural Language Processing and Computational Natural Language Learning* (EMNLP-CoNLL 2012), Jeju, Korea.

Afra Alishahi and Pirita Pyykkönen (2011). The onset of syntactic bootstrapping in word learning: Evidence from a computational study. *Proceedings of the 33nd Annual Conference of the Cognitive Science Society*, Boston, USA.

Alexis Palmer, **Afra Alishahi**, and Caroline Sporleder (2011). Robust Semantic Analysis for Unseen Data in FrameNet. RANLP 2011, Hissar, Bulgaria.

Afra Alishahi and Afsaneh Fazly (2010). Integrating syntactic knowledge into a model of cross-situational word learning. In *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*, Portland, Oregon.

Grzegorz Chrupała and **Afra Alishahi** (2010). Online entropy-based model of lexical category acquisition. In *Proceedings of the 14th Conference on Computational Natural Language Learning (CoNLL)*, Uppsala, Sweden.

Afsaneh Fazly, Fatemeh Ahmadi-Fakhr, **Afra Alishahi** and Suzanne Stevenson (2010). Cross-situational learning of low frequency words: the role of context familiarity and age of exposure. In *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*, Portland, Oregon.

Afra Alishahi and Grzegorz Chrupała (2009). Lexical category acquisition as an incremental process. In *Proceedings of the 5th Workshop on Psychocomputational Models of Human Language Acquisition*, Amsterdam, July 2009.

Afsaneh Fazly, **Afra Alishahi** and Suzanne Stevenson (2008). A probabilistic incremental model of word learning in the presence of referential uncertainty. In *Proceedings of the 30th Annual Conference of the Cognitive Science Society*, Washington, D.C.

Afra Alishahi, Afsaneh Fazly and Suzanne Stevenson (2008). Fast mapping in word learning: what probabilities tell us. In *Proceedings of the 12th Conference on Computational Natural Language Learning*, Manchester, UK.

Afra Alishahi and Suzanne Stevenson (2007). A cognitive model for the representation and acquisition of verb selectional preferences. In *Proceedings of the ACL Workshop on Cognitive Aspects of Computational Language Acquisition*, Prague, Czech Republic.

Afra Alishahi and Suzanne Stevenson (2007). A computational usage-based model for learning general properties of semantic roles. In *Proceedings of the European Cognitive Science Conference*, Delphi, Greece.

Afra Alishahi and Suzanne Stevenson (2005). The acquisition and use of argument structure constructions: a Bayesian model. In *Proceedings of the ACL 2005 Workshop on Psycho-computational Models of Human Language Acquisition*, Ann Arbor, USA.

Afra Alishahi and Suzanne Stevenson (2005). A probabilistic model of early argument

structure acquisition. In *Proceedings of the 27th Annual Conference of the Cognitive Science Society*, Stresa, Italy.

M. Amin Zia, **Afra Alishahi**, M. Reza A. Shirazi, Caro Lucas (2001). Development of a multi-agent information management system for Iran Power Industry: a case study. In *Proceedings of the first IEEE PowerTech Conference of the XXI Century*, Porto, Portugal.

Afra Alishahi and Caro Lucas (1998). A fuzzy clustering algorithm for automatic classification of concepts extracted from unstructured text. In *Proceedings of the 4th Annual International Conference of the Computer Society of Iran*, Tehran, Iran.

Caro Lucas and **Afra Alishahi** (1998). A hybrid neural network for concept clustering. In *Irano-Armenian Workshop on Scientific and Industrial Applications of Neural Networks*, Nor Amberd, Armenia.

BOOKS & BOOK CHAPTERS

Afra Alishahi, Yonatan Belinkov, Grzegorz Chrupała, Dieuwke Hupkes, Yuval Pinter, Hassan Sajjad (2020). Proceedings of the Third BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP. The 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP).

Grzegorz Chrupała, Tal Linzen and **Afra Alishahi** (2018). Proceedings of the 2018 EMNLP Workshop BlackboxNLP: Analyzing and Interpreting Neural Networks for NLP. The 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP).

Daniel Freudenthal and **Afra Alishahi** (2014). Computational models of language development. In P. Brooks and V. Kempe (editors), *Encyclopedia of Language Development*. SAGE Publications.

Thierry Poibeau, Aline Villavicencio, Anna Korhonen, and **Afra Alishahi** (2013). Cognitive aspects of computational language acquisition. Springer.

Afra Alishahi and Suzanne Stevenson (2013). Gradual Acquisition of Verb Selectional Preferences in a Bayesian Model. in Thierry Poibeau, Aline Villavicencio, Anna Korhonen, and Afra Alishahi (editors). *Cognitive aspects of computational language acquisition.* Springer.

Afra Alishahi. Computational Modeling of Human Language Acquisition (2010). *Synthesis Lectures on Human Language Technologies*, Morgan & Claypool.

Afra Alishahi (2008). A probabilistic model of early argument structure acquisition. Ph.D. dissertation, Department of Computer Science, University of Toronto.

NON-REFEREED PUBLICATIONS

Afra Alishahi, 2007. Book Review: Language and the learning curve. *Computational Linguistics*, 33:4, 602–603.

Teaching Experience

NATIONAL & INTERNATIONAL VENUES

Grounded Language Learning, from Sounds Images to Meaning (2019). Invited lecture at PAISS 2019 Artificial Intelligence Summer School, Paris, France.

Introduction to computational modelling (2016). LOT Winter School, Tilburg, The Netherlands.

What computational models can tell us about language (2012) SMART Cognitive Science Lectures, Faculty of Humanities, University of Amsterdam, The Netherlands.

Computational Modeling of Human Language Acquisition (2010, with A. Fazly). European Summer School in Logic, Language and Information (ESSLLI), University of Copenhagen, Denmark.

Computational Modeling of Human Language Acquisition (2009). The 47th Annual Meeting of the Association for Computational Linguistics (ACL), Singapore.

DEPT. OF COGNITIVE SCIENCE & AI, TILBURG UNIVERSITY

Computational Models of Language Learning, 2015–2020.
Masters course.

Research Skills: Data Processing with Python, 2017–2020.
Masters course.

DEPT. OF COMMUNICATION AND INFORMATION SCIENCES, TILBURG UNIVERSITY

Understanding Cooperation in Communication, 2013–2015.
Masters course.

Cognitive Linguistics, 2011–2014.
Bachelors course.

Language in the Digital Age (Introduction to NLP), 2013–2015.
Bachelors course.

Journalistic Data Mining, 2012.
Masters course.

Research Workshop: Human aspects of Information Technology, 2012.
Bachelors project.

DEPT. OF COMPUTATIONAL LINGUISTICS, SAARLAND UNIVERSITY

Cognitive Modeling of Human Language Acquisition, 2009–2010.
Graduate-level seminar.

Computational Psycholinguistics, 2008–2009.
Masters course.

DEPT. OF COMPUTER SCIENCE, UNIVERSITY OF TORONTO

Teaching Assistant,

Computer Programming, Algorithms and Data Structure, 2007.
Introduction to Computer Science, 2006, 2007.
Breaking the Code: How Children Learn Language, 2005, 2006.
Introduction to Artificial Intelligence, 2004.
Principles of Programming Languages, 2003, 2004.

DEPT. OF
COMPUTER
ENGINEERING,
TEHRAN
UNIVERSITY

Introduction to Computer Programming, (1999)
Bachelors course.

Professional Activities

INVITED TALKS

Invited talk at Cognitive Machine Learning (CoML), January 2021.

Keynote at *Sem/SemEval 2020, December 2020.

Invited talk at EurNLP 2020, Paris, November 2020 (postponed).

Grounding and interaction in models of human language acquisition. Linguistics Department, University of Geneva, December 2019.

Grounded Language Learning, from Sounds Images to Meaning (and everything in between). PAISS 2019: the PRAIRIE AI Summer School, Paris, October 2019.

Understanding emergent linguistic representations in neural models of language. Women in Data Science Conference 2019, Copenhagen, April 2019.

Getting closer to reality: grounding and interaction in models of human language acquisition. Computational Linguistics seminar, ILLC, Amsterdam, March 2019.

Getting closer to reality: grounding and interaction in models of human language acquisition. Center for Mind/Brain Sciences (CIMeC), Trento University, Italy, 2018.

Emerging representations of form and meaning in models of grounded language. Keynote at Workshop on Learning Language in Humans and in Machines, Ecole Normale Suprieure, Paris, France, 2018.

Emerging representations of form and meaning in models of grounded language. EcoGest meeting, Bielefeld University, Germany, 2018.

Emergence of linguistic knowledge in a visually-grounded model of speech. Institute for Language, Cognition and Computation (ILCC), School of Informatics, University of Edinburgh, Scotland, 2017.

Representations of language in a model of grounded speech. Keynote at Second Workshop on Language Learning, IEEE ICDL-EPIROB, Lisbon, Portugal, 2017.

Generalization patterns in a probabilistic model of argument structure acquisition. Computational Linguistics Laboratory, University of Pisa, Pisa, Italy, 2016.

Language learning in a perceptual context. EMNLP 2015 workshop on Cognitive Aspects of Computational Language Learning, Lisbon, Portugal, 2015.

Child word learning from a computational perspective. Center for Mind/Brain Sciences (CIMeC), University of Trento, Italy, 2013.

Language learning as a unified probabilistic process. Institute of Psychology, Health and Society, University of Liverpool, United Kingdom, 2012.

What computational models can tell us about language. SMART Cognitive Science Lectures, Faculty of Humanities, University of Amsterdam, The Netherlands, 2012.

A Bayesian account of the acquisition of abstract argument structure constructions. ATILA meeting, Antwerp, Belgium, 2012.

The acquisition of abstract argument structure constructions from child-directed data. The Fourth International Conference of the German Cognitive Linguistics Association, Bremen, Germany, 2010.

A Bayesian account of the acquisition of abstract argument structure constructions. Institute for Logic, Language, and Computation, University of Amsterdam, Netherlands, 2010.

Learning semantic roles from child-directed data: insights from a probabilistic model of early language learning. Research Centre for English and Applied Linguistics, University of Cambridge, United Kingdom, 2010.

Modeling different aspects of child language acquisition as a probabilistic process. Cognitive Development Center, Central European University (CEU), Budapest, Hungary, 2010.

A probabilistic model of early argument structure acquisition. The 8th annual meeting of the International Research Training Group (IRTG), University of Edinburgh, Scotland, 2008.

Language learning as a decision making process. Center for Adaptive Behaviour and Cognition (ABC), Max Planck Institute, Berlin, Germany, 2008.

Computational modeling of child verb learning. Applied Computer Science Group, Bielefeld University, Germany, 2007.

PROFESSIONAL ACTIVITIES & SOCIETY MEMBERSHIP

Senior Area Chair for Linguistic Theories, Cognitive Modeling and Psycholinguistics, Conference of the European Chapter of the Association for Computational Linguistics (EACL) 2021.

Area Chair for Interpretability and Analysis of Models for NLP, Conference of the Association for Computational Linguistics (ACL), 2021.

Area Chair for Interpretability and Analysis of Models for NLP, Conference of the Association for Computational Linguistics (ACL), July 2020.

Organizer, Third BlackboxNLP Workshop, Empirical Methods on Natural Language Pro-

cessing (EMNLP), Dominican Republic, November 2020.

Area Chair for Linguistic Theories Cognitive Modeling and Psycholinguistics, Conference of the Association for Computational Linguistics (ACL), July–August 2019.

Organizer, First BlackboxNLP Workshop, Empirical Methods on Natural Language Processing (EMNLP), Brussels, Belgium, November 2018.

Member of the best paper award committee, Conference on Computational Natural Language Learning (CoNLL), November 2018.

Area Chair for Conference on Computational Linguistics (COLING), August 2018.

Area Chair of Computational Psycholinguistics for Conference on Computational Linguistics (COLING), December 2016.

Program chair of the 19th Conference on Computational Natural Language Learning (CoNLL 2015) (with Alessandro Moschitti), July 2015.

Tutorial Chair of the 14th European chapter of the Association for Computational Linguistics (EACL), April 2014.

Area Chair of the Computational Models for Human Language Acquisition and Processing track, Empirical Methods on Natural Language Processing (EMNLP), October 2013.

Area Chair of the Computational Psycholinguistics track, 13th Conference of the European Chapter of the Association for computational Linguistics (EACL), April 2012.

Editorial Board Member, Frontiers in Language Sciences (2012–present).

Organizer of the 8th IRTG Summer School in Computational Linguistics and Psycholinguistics, Kloster Irsee, Germany, June 2009.

Co-chair of the EACL Workshop on Cognitive Aspects of Computational Language Acquisition, Athens, Greece, March 2009.

Program Committee for ACL, EACL, NAACL, EMNLP, COLING and CoNLL conferences since 2009.

Reviewer for journals
> *Transactions of the Association for Computational Linguistics*
> *Cognition*
> *Cognitive Science*
> *Language and Cognitive Processes*
> *Frontiers in Language Sciences*
> *Frontiers in Developmental Psychology*
> *Research on Language and Computation*

Reviewer for conferences
> Annual Meetings of the Cognitive Science Society (CogSci)
> Annual Meetings of the Association for Computational Linguistics (ACL)
> North American chapter of the Association for Computational Linguistics (NAACL)

Conference on Natural Language Learning (CoNLL)

European Cognitive Science Conference (EuroCogSci)

Conference on Human Factors in Computing Systems (CHI)

Member

CLAIRE, Confederation of Laboratories for Artificial Intelligence Research in Europe

PASCAL Network of Excellence, funded by the European Union

Association for Computational Linguistics

Cognitive Science Society

PhD Supervision   Yevgen Matusevych, daily supervisor (promoter: prof. A. Backus), 2012–2016.

Ákos Kádár, promoter (co-supervisor: dr. G. Chrupała; co-promoter: prof. E. Postma), 2014–2019.

Lieke Gelderloos, promoter (co-supervisors: dr. R. Fernandez, dr. G. Chrupała; co-promoter: prof. E. Postma), 2016–present.

Member of Doctorate Committee   Ravi Shekar, The Department of Information Engineering and Computer Science (DISI), University of Trento, May 2019.

Raquel Alhama, Institute of Logic, Language and Computation (ILLC), University of Amsterdam, November 2017.

Barend Beekhuizen, Leiden University Centre for Linguistics (LUCL), Leiden University, September 2015.