Dieuwke Hupkes

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EMPLOYMENT

ILLC, University of Amsterdam   **Amsterdam**
PhD Student in the Language in Interaction Consortium   *Current*

Facebook AI Research   **Paris**
Research Intern   *January - April 2019*

ILLC, University of Amsterdam   **Amsterdam**
Research Assistant   *February 2014 - June 2015*

CREATE, University of Amsterdam   **Amsterdam**
Pre-PhD fellowship   *February 2014 - June 2015*

EDUCATION

University of Amsterdam   **Amsterdam**
Master of Logic   *September 2011 - December 2013*

University of Edinburgh   **Edinburgh**
Exchange Semester   *Fall 2012*

University of Amsterdam   **Amsterdam**
Preparation year   *Sept 2010 - June 2011*

University of Amsterdam   **Amsterdam**
Bachelor of Science in Physics and Astronomy   *2006 - 2010*

RESEARCH INTERESTS

- Computational and cognitive models of natural language processing
- Statistical parsing, syntax
- Hierarchy and compositionality in artificial neural networks
- Learning biases
- Neurocomputational models of language (processing)
- language emergence

TEACHING EXPERIENCE

As thesis supervisor

Jaap Jumelet – Msc Artificial Intelligence   *Jan 2019 – now*

Gautier Dagan – Msc Artificial Intelligence   *Jan – Aug 2019*
  Co-Evolution of Language and Agent in Referential Games

Dennis Ulmer – Msc Artificial Intelligence   *Jan – Aug 2019*
  Recoding latent sentence representations

Diana Rodriguez Luna – Msc Artificial Intelligence *Jan – July 2019*
Language emergence in multi-agent referential games

Kris Korrel – Msc Artificial Intelligence *Jan – Nov 2018*
From sequence to attention

Sanne Bouwmeester – Msc Artificial Intelligence *Jan – Oct 2018*
Analysing seq-to-seq models in goal oriented dialogue: generalising to disfluencies

Krstó Proroković – Master of Logic *Jan – Nov 2018*
Learning to decide a formal language: a recurrent neural network approach

Anand Kumar Singh – Msc Artificial Intelligence *Jan – Aug 2018*
Pondering in artificial neural networks

Ujjwal Sharma – Msc Artificial Intelligence *Jan – Aug 2018*
Interpreting decision-making in interactive visual dialogue

Rezka Aufar Leonandya – Msc Artificial Intelligence *Jan – Aug 2018*
Learning to follow instructions

Lucas Weber – Msc Brain and Cognitive Science *Jan – Jun 2018*
Continual learning in humans and neuroscience-inspired AI

Philip Bouman – Bsc Artificial Intelligence *Jan – Aug 2018*
Modelling fonts with convolutional neural networks

As supervisor of individual/group projects

Syntactic Awareness in Language Models: Recurrence vs Self-Attention *Jun 2019*
Msc AI students Sander Bos, Lorian Colthof, Bryan Guevara and Vivian van Oijen

Unsupervised Grammar Induction in Emergent Languages *Jun 2019*
Msc AI students Silvan de Boer and Oskar van der Wal

On the Realisation of Compositionality in Neural Networks *Jun 2018*
Msc AI students Joris Baan, Jana Leible, Mitja Nikolaus, David Rau, Verna Dankers, Santhosh Rajamanickam and Dennis Ulmer

Analysing Subject-Verb agreement with Diagnostic Classification *Jun 2018*
Msc AI students Mario Giulianelli, Jack Harding and Florian Mohnert

What do language models encode? *Jun 2018*
Msc AI student Jaap Jumelet

Learning compositionality in Neural Networks *Jan 2018*
Master of Logic students Federico Schiaffino, Haukur Pál Jónsson, Max Rapp, Flavio Tisi and Yuan-Ho Yao

Guest lectures

- **Statistical Methods for Natural Language Semantics** *May 2019*
- **Foundations of Neural and Cognitive Modelling** *November 2018*
- **Cognitive Models of Language and beyond** *March 2018*
- **Natural Language Processing 1** *Dec 2017*
- **Cognitive Models of Language and Music** *Mar 2017*

As teaching assistant

Natural Language Processing 1 *Oct-Dec 2017*
Msc Artificial Intelligence, Master of Logic

Gomputational Semantics and Pragmatics *Sept-Oct 2016*
Msc Artificial Intelligence, Master of Logic

Evolution of Language and Music   *Feb-Apr 2016, Oct-Dec 2016*
Bsc Psychobiologie

Foundations of Neural and Cognitive Modelling   *Oct-Dec 2015*
Msc Artificial Intelligence, Master of Logic, Msc Brain and Cognitive Science

Unsupervised Language Learning   *Feb-Apr 2014, Feb-Apr 2015*
Msc Artificial Intelligence, Master of Logic

Automata and Formal Languages   *Apr-Jun 2013, Apr-Jun 2012*
Bsc Artificial Intelligence

Automata and Formal Languages   *Feb 2014, Feb 2013, Feb 2012*
Bsc Beta-Gamma

Biomechanics   *Feb-Jun 2013*
Bsc bewegingswetenschappen (*human motion sciences*)

AWARDS AND FELLOWSHIPS

Research Internship   *January 2019*
With Marco Baroni, at Facebook AI Research

Best Paper Award, BlackboxNLP 2018   *August 2018*
Under the Hood: Using Diagnostic Classifiers to Investigate and Improve how Language Models Track Agreement Information

Scholarship for Doctorate Studies   *June 2015*
With Willem Zuidema, in the Language in Interaction Consortium

Pre-PhD fellowship   *June 2015*
With Rens Bod, within CREATE

SERVICES

Organisation

Compositionality in Brains and Machines   **Leiden**
Workshop at the Lorentz workshop on compositionality   *August 2019*
Role: Lead organisor with Willem Zuidema and Marco Baroni. Tasks including writing workshop proposal, designing the workshop programme, inviting participants, being contact person for the Lorentz center and leading discussions during the workshop.

BlackboxNLP 2019 - Analyzing an interpreting Neural Networks   **Florence**
ACL workshop on analysing and interpreting neural networks   *August 2019*
Role: Co-organisation with Yonatan Belinkov, Grzegorz Chrupala and Tal Linzen. Tasks including sending out workshop calls, assigning reviewers, selecting papers, maintainance of workshop website and chairing sessions during the workshop.

Reviewing

- TACL
- BlackboxNLP 2019

Other

- PhD council ILLC, University of Amsterdam
- PhD council Faculty of Science, University of Amsterdam

TALKS & PANELS

- *October 9, 2019.* Subject verb agreement in neural language models – how, when and where?, *Johns Hopkins University, Baltimore*

- *October 1, 2019.* What do they learn? Neural networks, compositionality and interpretability. *Computational Cognition workshop, Osnabruek.*

- *September 3, 2019.* Guest speaker and panelist at the public event When fake looks all too real: the technology behind Deep Fake, *SPUI25, Amsterdam.*

- *August 1, 2019.* Blackbox NLP, **panel moderator**.

- *June 18, 2019.* The typology of emergent languages. *Interaction and the Evolution of Linguistic Complexity, Edinburgh.*

- *May 6.* The compositionality of neural networks: integrating symbolism and connectionism. *CS&AI / SIKS workshop on analyzing and interpreting neural networks for NLP, 's-Hertogenbosch.*

- *April 18.* The compositionality of neural networks: integrating symbolism and connectionism. *Invited internal talk at Saarland University, Saarbrücken.*

- *March 14.* On neural networks and compositionality. *Invited internal seminar at École normale supérieure, Paris.*

- *July 18, 2018.* Visualisation and 'diagnostic classifiers' reveal how recurrent and recursive neural networks process hierarchical structure. *IJCAI, Stockholm.*

- *June 12, 2018.* Learning compositionally through attentive guidance. *Invited internal seminar at the University of Copenhagen.*

- *May 9, 2017.* Processing hierarchical structure with RNNs. *Dagstuhl seminar on Human-like neural-symbolic computing.*

- *December 7, 2017.* The grammar of neural networks. *SMART workshop Grammars, Computation & Cognition, Amsterdam.*

- *December 15, 2017.* Hierarchical compositionality in recurrent neural networks. *Invited internal seminar at Rijksuniversiteit Groningen.*

- *May 25, 2016.* POS-tagging of Historical Dutch. *LREC, Portoroz.*

- *November 22, 2016.* How may neural networks process hierarchical structure? Insights from recursive and recurrent networks learning arithmetics. *Logic Tea at the University of Amsterdam.*

- *June 8, 2015* Using Parallel Data to improve Part-of-Speech tagging of 17th century Dutch. *DH Benelux, Antwerp.*

PUBLICATIONS

- Hupkes D., Rodriguez Luna D., Ponti E.M. and Bruni E. Internal and External Pressures on Language Emergence: Least Effort, Object Constancy and Frequency. *In prep.*

- Dagan, G., Hupkes, D. and Bruni E. Co-evolution of language and agent. *In prep.*

- Hupkes D., Dankers V., Mul M. and Bruni E. The compositionality of neural networks: integrating symbolism and connectionism. *Under review.*

- Jumelet J., Zuidema W. and Hupkes D. (2019). Analysing Neural Language Models: Contextual Decomposition Reveals Default Reasoning in Number and Gender Assignment. *CONLL 2019.*

- Baan J., Leible J., Nikolaus M., Rau D., Ulmer D., Baumgärtner T., Hupkes D. and Bruni E. (2019).

On the Realization of Compositionality in Neural Networks. *BlackboxNLP, ACL 2019.*

○ Ulmer D., Hupkes, D. and Bruni, E (2019). Assessing incrementality in sequence-to-sequence models. *Repl4NLP, ACL 2019.*

○ Korrel K., Hupkes D., Dankers V., and Bruni E. (2019) Transcoding compositionally: using attention to find more generalizable solutions. *BlackboxNLP, ACL 2019.*

○ Lakretz Y., Kruszewski G., Desbordes T., Hupkes D., Dehaene S. and Baroni M. (2019) The emergence of number and syntax units in LSTM language models. *NAACL 2019.*

○ Hupkes D., Singh A.K., Korrel K., Kruszewski G. and, Bruni E (2019). Learning compositionally through attentive guidance. *CICLing 2019.*

○ Leonandya R., Bruni E., Hupkes D. and Kruszewski G (2019). The Fast and the Flexible: training neural networks to learn to follow instructions from small data. *IWCS.*

○ Hupkes D., Veldhoen S., and Zuidema W. (2018). Visualisation and 'diagnostic classifiers' reveal how recurrent and recursive neural networks process hierarchical structure. *Journal of Artificial Intelligence Research.*

○ Giulianelli, M., Harding, J., Mohnert, F., Hupkes, D. and Zuidema, W. (2018). Under the hood: using diagnostic classifiers to investigate and improve how language models track agreement information. *BlackboxNLP 2018, ACL.*
Best paper award.

○ Zuidema W., Hupkes D., Wiggins G., Scharf C. and Rohrmeier M. (2018). Formal models of Structure Building in Music, Language and Animal Song. In *The Origins of Musicality.*

○ Jumelet, J. and Hupkes, D. (2018). Do language models understand anything? On the ability of LSTMs to understand negative polarity items. *BlackboxNLP 2018, ACL.*

○ Hupkes, D., Bouwmeester, S. and Fernández, R. (2018). Analysing the potential of seq2seq models for incremental interpretation in task-oriented dialogue. *BlackboxNLP 2018, ACL.*

○ Hupkes D. and Zuidema W. (2017) Diagnostic classification and symbolic guidance to understand and improve recurrent neural networks. *Interpreting, Explaining and Visualizing Deep Learning, NIPS2017.*

○ Veldhoen S., Hupkes D. and Zuidema W. (2016). Diagnostic Classifiers: Revealing how Neural Networks Process Hierarchical Shructure. *Cognitive Computation: Integrating Neural and Symbolic Approaches, NIPS2016.*

○ Hupkes D. and Bod R (2016) POS-tagging of Historical Dutch. *LREC2016.*

LANGUAGES

DUTCH:	Mothertongue	FRENCH:	Basic Knowledge
ENGLISH:	Fluent	RUSSIAN:	Basic Knowledge
ITALIAN:	Good command	GERMAN:	Basic Knowledge
SPANISH	Basic command	FRYSIAN:	Understanding

ET CETERA

I'm part of a competitive pole dance duo, we participated twice in the national championships, placing 1st and 2nd. In 2018, we also participated in the World Championship and arrived at place 10 of the world ranking. https://instagram.com/duo_polenotti.