Dieuwke Hupkes

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EMPLOYMENT

Meta — **Paris/Amsterdam**
Research Scientist — *December 2020 - Present*

European Lab for Learning an Intelligent Systems (ELLIS), UvA — **Amsterdam**
Scientific manager of ELLIS Amsterdam — *July 2020 - Present*

Institute for Informatics, University of Amsterdam — **Amsterdam**
Postdoc — *July 2020 - December 2020*

ILLC, University of Amsterdam — **Amsterdam**
Temporary lecturer — *January 2020 - June 2020*
- Courses: Linguistics and Language Processing & Human(e) AI

ILLC, University of Amsterdam — **Amsterdam**
PhD Student in the Language in Interaction Consortium — *July 2015 - January 2020*
- Advisor: Dr. Willem Zuidema & Prof. Dr. Rens Bod
  Topic: Interpretability and hierarchical compositionality in neural networks

Facebook AI Research — **Paris**
Research Intern — *January - April 2019*
- Advisors: Diane Bouchacourt and Marco Baroni
  Topic: Assessing compositionality of languages emerging in referential games

ILLC, University of Amsterdam — **Amsterdam**
Research Assistant — *February 2014 - June 2015*
- Under supervision of Dr. Willem Zuidema
  Topic: Neural models of parsing

CREATE, University of Amsterdam — **Amsterdam**
Pre-PhD fellowship — *February 2014 - June 2015*
- Under supervision of Prof. Dr. Rens Bod
  Topic: Part-of-Speech tagging of 17th century Dutch

EDUCATION

University of Amsterdam — **Amsterdam**
Doctorate degree — *July 2015 - June 2020*

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*

TEACHING EXPERIENCE

I obtained the Dutch Basic Teaching Qualification (UTQ/BKO) at the University of Amsterdam.

As main lecturer/coordinator

Taaltheorie en Taalverwerking *March-June 2020*
Bsc Artificial Intelligence

Human(e) AI *March-June 2020*
Elective IIS course

As PhD (co)Advisor

Lucas Weber *October 2019 – now*
Co-supervision with Elia Bruni

Lovish Madaan *September 2023 – now*
Academic supervisor: Pontus Stenetorp

As intern or resident manager

Yusuf Kocyigit *2023-2024*
Assessing the impact of evaluation data contamination in LLMs

Kaiser Sun *2022-2023*
Construct validity of compositional generalisation datasets

Verna Dankers *2022-2023*
Memorisation in NMT models

Itay Itzhak *2021-2022*
Localist representations in NMT models

Maartje ter Hoeve *2021*
Interactive NLP

As thesis supervisor

Hugh Mee Wong – Msc Artificial Intelligence *2021 – 2023*
Assessing Language Model Consistency on Multiple-Choice Tasks

Tom Kersten – Msc Artificial Intelligence *2020 – 2021*
The interpretability of neural language models

Sylke Goosen – Msc Artificial Intelligence *2020 – 2021*
Investigating neural language models

Jeroen Taal – Bsc Artificial Intelligence *2020*
Pruning of neural language models for Dutch

Hugh-Mee Wong – Bsc Artificial Intelligence *2020*
What do neural language models learn about Dutch syntax?

Oskar van der Wal – Msc Artificial Intelligence *2019 – 2020*
The grammar of emergent languages

Oscar Ligthart – Msc Artificial Intelligence *2019 – 2020*
Consistency and structure in emergent languages

Jaap Jumelet – Msc Artificial Intelligence *2019 – 2020*
The interpretability of neural language models

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

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

Diana Rodriguez Luna – Msc Artificial Intelligence *2019*
Language emergence in multi-agent referential games
In collaboration with Facebook AI Research

Kris Korrel – Msc Artificial Intelligence *2018*
From sequence to attention
In collaboration with Facebook AI Research

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

Krstó Proroković – Master of Logic *2018*
Learning to decide a formal language: a recurrent neural network approach
In collaboration with Facebook AI Research

Anand Kumar Singh – Msc Artificial Intelligence *2018*
Pondering in artificial neural networks
In collaboration with Facebook AI Research

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

Rezka Aufar Leonandya – Msc Artificial Intelligence *2018*
Learning to follow instructions
In collaboration with Facebook AI Research

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

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

As supervisor of individual or group projects

Overgeneralisation in neural sequence to sequence models *2020*
Msc AI student Anna Langendijk

Generalised contextual decomposition for transformer models *2020*
Msc AI student Tom Kersten

XAI: A conceptual framework for interpretability methods *2019 - 2020*
Msc Brain and Cognitive Science student Lewis O'Sullivan

The compositionality of neural networks *2018 - 2019*
Msc AI students Verna Dankers and Mathijs Mul

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

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

On the Realisation of Compositionality in Neural Networks *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 *2018*
Msc AI students Mario Giulianelli, Jack Harding and Florian Mohnert

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

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

AWARDS AND FELLOWSHIPS

Honourary mention *CoNLL, 2023*
The validity of evaluation results: assessing concurrence across compositionality benchmarks

Honourary mention *CoNLL, 2023*
Mind the instructions; a holistic evaluation of consistency and interactions in prompt-based learning

Best paper award *MLRC, 2022*
A replication study of compositional generalization works on semantic parsing

Best paper award *ConLL, 2021*
Generalising to German prular noun classes, from the perspective of a recurrent neural network

Honourary mention *CoNLL, 2019*
Analysing neural language models: contextual decomposition reveals default reasoning in number and gender assignment

Best paper award *BlackBoxNLP, 2018*
Under the hood: using diagnostic classifiers to investigate and improve how language models track agreement information

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

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

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

SERVICES

Organisation

GenBench workshop 2023 **Singapore**
EMNLP workshop on (benchmarking) generalisation in NLP *November 2023*
Role: Lead organisor

BlackboxNLP 2022 - Analyzing an interpreting Neural Networks **Abu Dabhi**
EMNLP workshop on analysing and interpreting neural networks *November 2022*
Role: Lead organisor

BlackboxNLP 2021 - Analyzing an interpreting Neural Networks **Hybrid**
EMNLP workshop on analysing and interpreting neural networks *November 2021*
Role: Co-organiser

BlackboxNLP 2020 - Analyzing an interpreting Neural Networks **Virtual**
EMNLP workshop on analysing and interpreting neural networks *November 2020*
Role: Co-organiser

Compositionality in Brains and Machines **Leiden**
Workshop at the Lorentz workshop on compositionality *August 2019*
Role: Lead organisor with Willem Zuidema and Marco Baroni.

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.

Grammar, Computation and Cognition **Amsterdam**
SMART workshop in honour of the scientific legacy of Remko Scha *December 2017*
Role: Co-organisation with Willem Zuidema.

Reviewing

- **Conferences and workshops**: ICLR, Neurips, ACL, EACL, EMNLP, NAACL, CoNLL, BlackboxNLP, Gecko, Student Workshops
- **Journals**: Computational Linguistics, TACL, Nature Machine Intelligence, Congitive Systems Research
- **As (senior) Area Chair**: EACL, NAACL, EMNLP, ACL, ARR

HIGHLIGHTED TALKS & PANELS

A full overview of the talks I have given can be found on my website at https://dieuwkehupkes.nl/talks/.

- *October 10, 2023.* ChatGPT and other generative AI tools: risks and benefits, **Council of the European Union, Brussels** (pitch and panel discussion)
- *April 11, 2023.* The (un?)importance of generalisation in NLP, **MSR, Montreal** (virtual talk)
- *January 27, 2023.* GenBench: State-of-the-art generalisation research in NLP, **University of Cambridge** (virtual talk)
- *June 29-30, 2022.* Are Neural Networks Compositional, and How Do We Even Know? **The Challenge of Compositionality for AI (virtual talk & panel)**
- ***June 15, 2022.*** **Evaluating generalisation in natural language processing models**, **ODSC Europe, London** (London)
- *April 14, 2022.* Evaluating generalisation in neural networks for NLP, **Stanford, Palo Alto**
- *March 17, 2021.* Kunnen we kunstmatige intelligentie nog doorgronden? Studium Generale, **Studium Generale, Utrecht** (virtual talk)
- *February 11, 2021.*, Compositionality decomposed: how do neural networks generalise? **Women@CL, University of Cambridge** (virtual talk)
- *October 31, 2020.* Neural networks as explanatory models of language processing, **ILCC, University of Edinburgh** (virtual talk)
- *September 17, 2020.* Neural networks as explanatory models, **AllenNLP, Seattle** (virtual talk)
- *October 9, 2019.* Subject verb agreement in neural language models – how, when and where? **Johns Hopkins University, Baltimore**
- *September 3, 2019.* Guest speaker and panelist at the public event When fake looks all too real: the technology behind Deep Fake, **SPUI25, Amsterdam**.
- *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. **University of Copenhagen.**
- *May 9, 2017.* Processing hierarchical structure with RNNs. **Dagstuhl**
- *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, University of Amsterdam.**
- *June 8, 2015* Using Parallel Data to improve Part-of-Speech tagging of 17th century Dutch. **DH Benelux, Antwerp.**

HIGHLIGHTED PUBLICATIONS

A full overview of my publications can be found at my website (https://dieuwkehupkes.nl/publications/ or on my Google Scholar Page.

- **D. Hupkes**, M. Giulianelli, V. Dankers, et. al (2023). A taxonomy and review of generalization research in NLP. Nature.
- V. Dankers, E. Bruni, **D. Hupkes** The paradox of the compositionality of natural language: a neural machine translation case study. ACL.
- V. Dankers, A. Langedijk, K. McCurdy, A. Williams, **D. Hupkes** (2021). Generalising to German plural noun classes, from the perspective of a recurrent neural network, CoNLL. **Best paper award**
- **D. Hupkes**, V. Dankers, M. Mul, E. Bruni (2020). Compositionality decomposed: how do neural networks generalise?. JAIR.
- **D. Hupkes**, S. Veldhoen, Zuidema, W. (2018). Visualisation and 'diagnostic classifiers' reveal how recurrent and recursive neural networks process hierarchical structure. JAIR.
- 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**.

LANGUAGES

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

ET CETERA

In my free time, I am a competitive pole dancer. I participated twice in the natural championships in the category doubles, placing 1st and 2nd in 2017 and 2018, respectively. In 2018, we also participated in the World Championship and arrived at place 10 of the world ranking. You can find our performances on youtube, or – partly – on our instagram page. Since 2018, I participated only in solo competitions.