MARIO GIULIANELLI

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Profile

PhD candidate at the Institute for Logic, Language and Computation of the University of Amsterdam, in the Dialogue Modelling Group led by Raquel Fernández. I analyse and model **language production and comprehension** with computational methods. My main research goal is defining empirical measures of **human-likeness** that can be used (i) to evaluate the alignment of machine-generated utterances to human communication patterns and strategies, and (ii) to develop **NLG** models that more closely follow such patterns and strategies. I am also interested in psycholinguistic and sociolinguistic studies of **variation and change** as they provide insights into how to build more resilient and human-compatible language technologies.

Education

MSc Artificial Intelligence, University of Amsterdam, Netherland — 2019
  Honours degree, cum laude. Final grade: 8.88 - ECTS A - First Class

  MSc Thesis: Lexical Semantic Change Analysis with Contextualised Word Representations. In affiliation with the Institute for Advanced Study. Grade: 9.5 (top 5% of all Master's theses grades awarded at the University of Amsterdam). ADS Thesis Award 2020.

BA Computational Linguistics, University of Tübingen, Germany — 2017
  Final grade: 1.2 - ECTS A - First Class

  BA Thesis. Semi-supervised emotion lexicon expansion with label propagation and specialized word embeddings. Grade 1.0.

Italian Generate Certificate of Education (100/100)**, Rome, Italy — 2014**

French Generate Certificate of Education (18/20)**, Rome, Italy — 2014**

Awards and scholarships

ADS Master Thesis Award — 2020
  The Amsterdam Data Science Thesis Awards promotes excellence in Data Science and AI from students in Amsterdam-based knowledge institutes.

IAS Excellence Student — 2019
  The Institute for Advance Study of the University of Amsterdam offered nine outstanding students the chance to work on their final thesis alongside renowned researchers and talented early-career scholars.

Best Paper Award at BlackBoxNLP — 2018
Best Paper Award awarded at the Workshop on *Analyzing and Interpreting Neural Networks for NLP* (BlackBoxNLP), held in Brussels at EMNLP 2018, one of the main international NLP venues.

Amsterdam Science Talent Scholarship — 2017-2019
The Amsterdam Science Talent Scholarship selects students on the basis of their academic excellence and promise in the proposed field.

Deutschlandstipendium — 2016-2017
The *Deutschlandstipendium* supports highly talented students in German universities, without consideration of income and nationality.

Certificat d'Inscription au Tableau d'Honneur — 2014
Acknowledgement for advanced knowledge of French by the *Association des Membres de l'Ordre des Palmes Académiques*.

Work experience

PhD Candidate, University of Amsterdam — 2019-2023
I am a third-year PhD candidate at the Institute for Logic, Language, and Computation, where I work on computational semantics and pragmatics models for natural language generation (**NLG**) and understanding (**NLU**). I am part of the DREAM (Distributed dynamic REpresentations for diAlogue Management) ERC project and member of the Dialogue Modelling Group led by Raquel Fernández.

Student supervisor, University of Amsterdam, 2021-present
I supervise three student projects, respectively on language model **interpretability**, **voice conversion**, and **semantic change** modelling. The first has resulted in a conference paper currently under submission; the latter two are ongoing Master's thesis projects. I help the students develop project proposals and monitor their progress in weekly meetings.

Member of the PhD Council, Faculty of Science — 2020-present
I represent the Institute for Logic, Language, and Computation in the PhD Council of the Faculty of Science of the University of Amsterdam. As a council member, I make sure the university management is in touch with the issues and requests of PhD students and I organise initiatives to provide my fellow students with support and opportunities. The themes I am responsible for are **diversity** and **interdisciplinarity**.

Workshop Organiser, BlackboxNLP, at EMNLP 2021
I worked as an organiser of the 4th edition of BlackboxNLP, a well-established workshop on **interpretability** and **explainability** of machine learning systems for NLP, which took place in a hybrid format at EMNLP 2021. I contributed by designing the hybrid programme, leading the online workshop sessions, and acting as a meta-reviewer.

Project coordinator, University of Amsterdam, 2021

I coordinated a team of eleven Bachelor, Master, and PhD students leading to three (out of three) accepted task submissions (Fantasy Reasoning, Metaphor Understanding, and Implicit Relations) to the Beyond The Imitation Game Benchmark (Big-bench), a collaborative benchmark intended to probe large language models and extrapolate their future capabilities. My job was to help the students develop their ideas into actionable research projects and to manage their successful execution.

Lab Coordinator, MSc AI, University of Amsterdam — 2020-2021

I coordinated teaching assistants and I was responsible for lab assignments during two editions of the MSc AI course *Natural Language Processing 1*.

Teaching Assistant, MSc AI and Logic, University of Amsterdam — 2020

I held seminar sessions and guided final projects for *Computational Dialogue Modelling*, an advanced course offered to MSc AI and MSc Logic students. I participated in this role for two consecutive editions of the course.

Teaching Assistant, MSc AI, University of Amsterdam — 2018-2019

I held lab sessions and corrected coding and theory assignments for the MSc AI course *Natural Language Processing 1*, obtaining an average student feedback of 8.0 in 2018 and 9.0 in 2019.

Intern, IBM Research and Development, Germany — 2016-2017

I developed the full sentiment analysis and information extraction Italian pipeline for the IBM Watson Analytics for Social Media system.

Research Assistant, University of Tübingen — 2015-2016

I worked in the Theoretical Computational Linguistics Group with Prof Dr Walt Detmar Meurers, developing an app for second language acquisition.

Teaching Assistant, BA CompLing, University of Tübingen — 2015-2016

I held lab sessions and corrected assignments for two courses of the BA Computational Linguistics: *Data Structures and Algorithms I* and *II* (in Java).

Publications

Andrey Kutuzov, Mario Giulianelli, Lidia Pivovarova. 2022. **Do Not Fire the Linguist: Grammatical Profiles Help Language Models Detect Semantic Change.** To appear in *Proceedings of the 3rd Workshop on Computational Approaches to Historical Language Change (LChange'22).*

The Beyond the Imitation Game Benchmark. *Forthcoming.*

Mario Giulianelli, Arabella Sinclair, Raquel Fernández. 2021. **Is Information Density Uniform in Task-Oriented Dialogues?** In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP 2021).*

Mario Giulianelli and Raquel Fernández. 2021. **Analysing Human Strategies of Information Transmission as a Function of Discourse Context.** In *Proceedings of the 25th Conference on Computational Natural Language Learning (CoNLL 2021).*

Mario Giulianelli, Andrey Kutuzov, Lidia Pivovarova. 2021. **Grammatical Profiling for Semantic Change Detection.** In *Proceedings of the 25th Conference on Computational Natural Language Learning (CoNLL 2021).*

Mario Giulianelli, Marco Del Tredici, and Raquel Fernández. (2020). **Analysing Lexical Semantic Change with Contextualised Word Representations.** In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics.*

Ece Takmaz, Mario Giulianelli, Sandro Pezzelle, Arabella Sinclair and Raquel Fernández. (2020). **Refer, Reuse, Reduce: Generating Subsequent References in Visual and Conversational Contexts.** In *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing.*

Andrey Kutuzov and Mario Giulianelli. (2020). **UiO-UvA at SemEval-2020 Task 1: Contextualised Embeddings for Lexical Semantic Change Detection.** In *Proceedings of the 14th International Workshop on Semantic Evaluation.*

Mario Giulianelli, Jacqueline Harding, Florian Mohnert, Dieuwke Hupkes, and Willem Zuidema. (2018). **Under the Hood: Using Diagnostic Classifiers to Investigate and Improve how Language Models Track Agreement Information.** In *Proceedings of the 1st Workshop on Analyzing and Interpreting Neural Networks for NLP (BlackBoxNLP).* Best paper award.

Mario Giulianelli and Daniel de Kok. (2018). **Semi-supervised emotion lexicon expansion with label propagation.** *Computational Linguistics in the Netherlands Journal 8.*

Orals and posters

Computational modelling of language production

Invited talk at the Language Technology Seminar. Language Technology Group. University of Oslo, Norway. 14 March 2021.

Poster at Meaning in Context: Pragmatic Communication in Humans and Machines. NeurIPS 2021 Workshop. Online. 13 December 2021.

Talk at CoNLL 2021. Online. 11 November 2021.

Poster at EMNLP 2021. Online. 9 November 2021.

Talk at NLPitch. Institute for Logic, Language and Computation. University of Amsterdam, Netherlands. 26 October 2020.

Poster at ELLIS NLP. Online. 30 July 2021.

Talk at AILC Lectures on Computational Linguistics. Università Tor Vergata. Rome, Italy. 17 June 2021.

Lexical semantic change

Poster at CoNLL 2021. Online. 11 November 2021.

Invited talk at Cognitive Machine Learning Lab. Ecole Normale Supérieure. Paris, France. 29 June 2021.

Poster at SemEval 2020. Online. 12 December 2020.

Talk at Symposium on Meaning Variation in Social Contexts. Institute for Logic, Language and Computation. Amsterdam, NL. 5 November 2020.

Talk at ACL 2020. Online. 7 July 2020.

Poster at GeCKo 2020 (Integrating Generic and Contextual Knowledge). Online. 18 May 2020.

Poster at EurNLP. London, UK. 11 October 2019.

Poster at Interacting Minds (Centre for Communication, Cognition and Computation). Egmond aan Zee, Netherlands. 30 August 2019.

Language modelling and interpretability

Talk at Computational Linguistic Seminar. Institute for Logic, Language and Computation. University of Amsterdam, Netherlands. 5 October 2021.

Guest lecture for NLP 1, MSc AI. University of Amsterdam, Netherlands. Online. 18 November 2020.

Guest talk at Cognitive Science & Artificial Intelligence PhD Group. Tilburg, Netherlands. 1 May 2020.

Talk at Cool Logic Seminar. Amsterdam, Netherlands. 1 February 2019.

Talk at BlackBoxNLP. EMNLP, Brussels, Belgium. 1 November 2018.

Talk at CLIN (Computational Linguistics in the Netherlands). Nijmegen, Netherlands. 26 January 2018.

Languages

Italian: native
English: full professional proficiency (IELTS Band 8)
German: fluent (Goethe-Zertifikat B2, *sehr gut*)
French: fluent (DELF B2, and French Generate Certificate of Education)
Dutch: basic (UvA Talen, A2)

IT competences

Programming languages
Advanced: Python
Proficient: Java
Intermediate: Matlab, Prolog, Netlogo, R, JAGS, JavaScript

Python libraries I use everyday
NumPy, SciPy, scikit-learn, Pandas, HuggingFace, NLTK, Spacy, matplotlib, seaborn, plotly

Markup languages
Intermediate: HTML, CSS, XML, XSLT, XPath

Phonetic analysis
Praat

Past research projects (as a student)

Speaker Adaptation. Measuring alignment across topics and linguistic markers. University of Amsterdam. Supervisor: Dr Raquel Fernández.

Digital Humanities. Extraction of event graphs from Kafka's short stories. Automatic annotation of emotional events and temporal relations. University of Tübingen. Supervisor: Dr Magdalena Wolska.

Psycholinguistics. Response time of German native speakers reacting to different types of foreign mispronunciations. University of Tübingen. Supervisor: Dr Fabian Tomaschek.

Computational Intelligence. Self driving controllers using neural networks, reservoir computing, and evolutionary algorithms. University of Amsterdam.

Language Modelling. Evaluating the syntactic competence of Recurrent Additive Networks language models. University of Amsterdam.