

Michele Cafagna

PH. D - MARIE SKŁODOWSKA-CURIE, MACHINE LEARNING RESEARCHER & ENGINEER

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Education

Institute of Linguistics and Language Technology, University of Malta

Msida, Malta

PH. D. - MARIE SKŁODOWSKA-CURIE FELLOW

Sep. 2020 - Present

- Research in XAI and Multimodal Generative AI with focus on Multimodal Semantic Grounding and Model Transparency.

Università di Pisa

Pisa, Italy

MSC. IN COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE, 110/110

2017 - 2019

- Master Thesis on Headline Generation and Analysis of Writing Styles in Journalism

Università degli Studi di Bari

Bari, Italy

B.S. IN COMPUTER SCIENCE AND SOFTWARE PRODUCTION TECHNOLOGIES, FULL MARKS

2014 - 2017

- Bachelor Thesis titled Software system based on pattern recognition to features extraction of leukocyte cells

Skills

Professional

Natural Language Processing, Natural Language Generation, Natural Language Understanding, Computer Vision, Multimodality, XAI, Research, Machine Learning, Software Engineering, Data Analysis, Evaluation, Data Collection, Test Driven Development, Microservices, OpenAPI, Agile.

Programming

Python, C/C++, Bash, JAVA, Matlab, Javascript

Software

Pytorch, Wandb, Docker, Git, Linux, Flask with Python, LaTeX

Languages

English (professional proficiency), Italian (native), French and Spanish (intermediate proficiency)

Experience

Orange Innovation Labs

Lannion, France

RESEARCH INTERN

Oct. 2022 - December 2022

- Multimodal XAI for industrial application
- Developed a model-agnostic XAI technique to explain Vision-to-Text predictions, based on visual and textual semantics

University of Utrecht

Utrecht, The Netherlands

VISITING RESEARCHER

Jan. 2022 - Aug 2022

- Worked on explainable AI techniques applied to V&L models
- Performed an in-depth analysis on the impact of the exposure to high-level linguistic concepts to V&L generative models
- Master Student supervision in a V&L project

Aptus.AI

Pisa, Italy

MACHINE LEARNING RESEARCH SCIENTIST & SOFTWARE ENGINEER

Jul. 2019 - Sep. 2020

- Research, development and deployment of Deep learning multimodal models
- Implement and design microservices architectures for AI-based applications
- Work closely to other team members to plan, design, and develop robust solutions, in an Agile workflow

Research Center For Language and Cognition (CLCG), University of Groningen

Groningen, The Netherlands

VISITING RESEARCHER

Apr. 2019 - Jul. 2019

- Worked on Generative Language Models and Analysis of Writing Styles in Journalism under the supervision of Prof. Malvina Nissim
- Collected and analysed hundreds of thousands of news scraped from Italian newspapers
- Experimented with various generative models for headline generation task, assessed by means of human evaluation
- Developed an automatic methodology based on classification, to evaluate the stylistic features learned by a generative language model
- Devised a method to evaluate the styles of two corpora observing word shifts in the embedding space

Selected Publications

Interpreting Vision and Language Generative Models with Semantic Visual Priors

MICHELE CAFAGNA, LINA MARIA ROJAS BARAHONA, KEES VAN DEEMTER, ALBERT GATT

Frontiers in AI Journal

2023

HL Dataset: Visually-grounded Description of Scenes, Actions and Rationales

MICHELE CAFAGNA, KEES VAN DEEMTER, ALBERT GATT

INLG, Prague, Czech Republic

2023

Understanding Cross-modal Interactions in V&L Models that Generate Scene Descriptions

MICHELE CAFAGNA, KEES VAN DEEMTER, ALBERT GATT

UM-IoS Workshop, EMNLP 2022, Abu Dhabi, United Arab Emirates

2022

VALSE: A Task-Independent Benchmark for Vision and Language Models Centered on Linguistic Phenomena

LETITIA PARCALABESCU, MICHELE CAFAGNA, LILITTA MURADJAN, ANETTE FRANK, IACER CALIXTO AND ALBERT GATT

ACL 2022, Dublin, Ireland

2022

What Vision-Language Models ‘See’ when they See Scenes

MICHELE CAFAGNA, KEES VAN DEEMTER AND ALBERT GATT

pre-print, in submission

2021

VILMA: A Zero-Shot Benchmark for Linguistic and Temporal Grounding in Video-Language Models

ILKER KESEN, ANDREA PEDROTTI, MUSTAFA DOGAN, MICHELE CAFAGNA, EMRE CAN ACIKGOZ, LETITIA PARCALABESCU, IACER CALIXTO, ANETTE FRANK, ALBERT GATT, AYKUT ERDEM, ERKUT ERDEM

submitted to ICLR2024

2023

TextFocus: Assessing the Faithfulness of Feature Attribution Methods in NLP

ETTORE MARIOTTI, MICHELE CAFAGNA, ANNA ARIAS DUART, ALBERT GATT

submitted to TACL

2023

GePpeTto Carves Italian into a Language Model

LORENZO DE MATTEI, MICHELE CAFAGNA, FELICE DELL’ORLETTA, MALVINA NISSIM, MARCO GUERINI

CLiC-it, Bologna, Italy

2020

Honors & Awards

2023	Outstanding reviewer , The 17th Conference of the European Chapter of the Association for Computational Linguistics (EACL2023)	<i>Dubrovnik, Croatia</i>
2019	Best Paper Award Finalist with Special Mention , Clic-it 2019 Sixth Italian Conference on Computational Linguistics	<i>Bari, Italy</i>
2017	Finalist , e-Health Award. Research Competition or project on Digital Health, AiSDet Associazione Italiana di Sanità Digitale e Telemedicina	<i>Bari, Italy</i>

Projects

NL4XAI - Natural Language For Explainable Artificial Intelligence

University of Malta, Malta

EARLY STAGE RESEARCHER

August. 2019 - Present

- NL4XAI is an advanced training programme. The project selected 11 creative, entrepreneurial and innovative early-stage researchers (ESRs), who will face the challenge of making AI self-explanatory and thus contributing to translate knowledge into products and services for economic and social benefit, with the support of Explainable AI (XAI) systems. Project consortium consists of 10 beneficiaries and 8 partner organization and it is funded by the Horizon 2020 research and innovation programme, through a Marie Skłodowska-Curie grant, in the framework of the European Union's bet for Explainable Artificial Intelligence
- My main challenge is to study deep multimodal architectures for generating language from visual data, looking 'under the hood' for evidence that the choices made by a generator are indeed grounded in the input, that is, motivated by (and explainable on the basis of) the sensory information.

Selected Presentations

16th International Natural Language Generation Conference (INLG2 2023)

Prague, Czech Republic

POSTER PRESENTER

Sep. 2023

- HL Dataset: Visually-grounded Description of Scenes, Actions and Rationales

The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2022)

Abu Dhabi, United Arab Emirates

POSTER PRESENTER

Dec. 2022

- Understanding Cross-modal Interactions in V&L Models that Generate Scene Descriptions

60th Annual Meeting of the Association for Computational Linguistics (ACL 2022)

Dublin, Ireland

ORAL AND POSTER PRESENTATION

May. 2022

- VALSE: A Task-Independent Benchmark for Vision and Language Models Centered on Linguistics Phenomena

Advanced Language Processing Winter School (ALPS 2022)

Grenoble, France (online)

POSTER PRESENTATION

Jun. 2022

- Presented "Multimodal Grounding and Semantic Transparency for Generative VL models"

26th International Conference on Applications of Natural Language to Information Systems (NLDB-2021)

DFKI Saarbrücken, Germany

ORAL PRESENTER

Jun. 2020

- The panel was dedicated to Natural Language Technologies for Explainable AI. My presentation was focused on our work on analysing pretrained Vision-Language models capabilities to link high level concepts present in scenes to low-level information.

EVALITA2020 Seventh Evaluation Campaign of NLP and SPeech Tools for Italian

online

ORAL PRESENTER

Nov. 2020

- "Change Headline, Adapt News, GEnerate Shared Task", CHANGE-IT!@EVALITA2020. Lorenzo De Mattei, Michele Cafagna, Malvina Nissim, Felice Dell'Orletta, Albert Gatt.

Clic-it 2019 Sixth Italian Conference on Computational Linguistics

Bari, Italy

ORAL PRESENTER

Nov. 2019

- Embeddings shifts as proxies for different word use in Italian newspapers. Michele Cafagna, Lorenzo De Mattei, Malvina Nissim.

Reviewing Activity

2023	EMNLP 2023 , The 2023 Conference on Empirical Methods in Natural Language Processing	<i>Singapore</i>
2023	ECAI 2023 , 26th European Conference on Artificial Intelligence	<i>Kraków, Poland</i>
2023	INLG 2023 , 16th International Natural Language Generation Conference	<i>Prague, Czech Republic</i>
2023	ACL 2023 , 61th Annual Meeting of the Association for Computational Linguistics	<i>Toronto, Canada</i>
2022	EACL 2023 , European Chapter of the ACL	<i>Dubrovnik, Croatia</i>
2022-2023	Computer Speech & Language Journal , International Speech Communication Association (ISCA)	<i>Gyeongju, South Korea</i>
2022	COLING 2022 , The 29th International Conference on Computational Linguistics	<i>Aberdeen, UK</i>
2021	INLG 2021 , 14th International Conference on Natural Language Generation	<i>(Online)</i>