

# Dr. Ing. Nicolo' Brandizzi

AI Researcher  
PostDoc at Fraunhofer IAIS



## CONTACTS

- nicolo.brandizzi@iais.fraunhofer.de
- Bonn, Germany
- nicofirst1.github.io
- nicofirst1
- in Nicolo' Brandizzi
- 17/01/1995

## SKILLS

### Programming

- Python 9 year(s)
- Bash 7 year(s)
- LaTeX 7 year(s)
- Matlab 2 year(s)
- C++ 2 year(s)
- HTML/CSS 1 year(s)

### Frameworks

- Pytorch 4 year(s)
- Numpy 6 year(s)
- Tensorflow 2 year(s)
- OpenCV 3 year(s)

### Operating Systems

- MacOS 16 year(s)
- Linux 8 year(s)
- Windows 2 year(s)

### Languages

- |         |        |
|---------|--------|
| Italian | Native |
| English | C1     |
| Spanish | A2     |
| German  | A1     |

## ABOUT ME

- Martial arts enthusiast 6 year(s)
- RPG aficionado 12 year(s)
- Drum player 4 year(s)

## WORK EXPERIENCE

**PostDoc at Fraunhofer-IAIS** 03/2024 - Ongoing St. Augustin, Germany

Engaged in the research and development of scalable data pipelines for large language models, focusing on multilingual and multimodal data integration. Applied my expertise to standardize data processing workflows, ensuring efficiency and quality in data preparation.

**Research Collaborator** 02/2023 - 03/2024 Sapienza University of Rome, Italy

Contracted for the AFORS "Trust your Agent" project, focusing on mixed human-machine cooperation based on model-based, hierarchical, and communication-augmented reinforcement learning. The project aimed to develop novel approaches for effective human-AI collaboration, with outcomes contributing to the field of trust and influence in AI systems.

**Research Scientist at Basis Health** 10/2022 - 04/2023 Middletown, 19709, USA (Remote)

Conducted in-depth analysis of academic literature related to wearable data and health applications, with a focus on identifying cutting-edge solutions. Leveraged insights from research papers to drive innovation in industry applications. Collaborated with cross-functional teams to translate academic findings into practical approaches and techniques for data analysis, aiming to improve personal health outcomes.

**Teaching Assistant** 07/2020 - 09/2022 Sapienza University of Rome, Italy

I have held several teaching assistant positions, including for the courses *Tecniche di Programmazione* and *Seminars in Artificial Intelligence*. In these roles, I was responsible for leading discussions, providing support to students, grading assignments and exams, and facilitating a positive learning environment.

**Research Collaborator** 07/2021 - 09/2021 Sapienza University of Rome, Italy

Engaged in the MBDA project - Artificial Intelligence Techniques for Assisted Mission Planning. Authored a technical report on "Multi-agent Model Based Reinforcement Learning," showcasing expertise in this field and demonstrating the ability to effectively communicate complex technical concepts and results.

## ACHIEVEMENTS, GRANTS AND AWARDS


### Grants & Fellowships

- 09/2023 - 09/2023 **RWTH Aachen University:** "Future of AI" Summit in Aachen
- 07/2023 - 07/2023 **TAILOR:** Connectivity Fund
- 06/2023 - 12/2023 **University Van Amsterdam:** Research Engineering Support Grant
- 09/2022 - 09/2022 **COST Action EU:** Multi3Generation Training School
- 10/2021 - 10/2022 **Sapienza University of Rome:** Research scholarship (Avvio di ricerca)

### Awards

- 2021 - Spotlight paper in Adaptive and Learning Agents Workshop [ALA21] at AAMAS.
- 2020 - **First classified** for Ph.D. scholarship at Sapienza University of Rome, Italy.

## Ph.D. Engineering in Computer Science

 2020 - 2024

 Sapienza University of Rome, Italy

- **Ph.D. Thesis:** “Conversational Agents in Human-Machine Interaction: Reinforcement Learning and Theory of Mind in Language Modeling”, under supervision of [Prof. Luca Iocchi](#) and [Prof. Roberto Navigli](#).
- **Research Visit at UBT:** I completed a 10 months (04/2023 - 02/2024) research visit at the University of Bayreuth under the supervision of [Prof. Daniel Buschek](#).
- **Research Visit at UvA:** I completed a 5 months (03/2022 - 08/2022) scientific visiting period at Amsterdam university under the supervision of [Prof. Raquel Fernández](#).
- **Thesis Supervision:** I have provided supervision for several Master’s students in their thesis writing.
- **Research Group:** I am part of the [Ro.Co.Co.](#) lab at [DIAG](#) ( Dipartimento di Ingegneria informatica, automatica e gestionale). My supervisor is [Prof. Luca Iocchi](#).


## M.Sc. of Engineering in Artificial Intelligence and Robotics


 2017 - 2020

 Sapienza University of Rome, Italy

- **Grade :** 110 with honors /110 (GPA 4/4).
- **M.Sc. Thesis:** “Reinforcement Lupus: Cooperation through emergent communication in The Werewolf social deduction game”, under supervision of [Prof. Luca Iocchi](#).
- **Erasmus Program:** I completed a 10 months (10/2019 - 08/2020) Erasmus program in the University of Groningen, Netherlands, under the supervision of [Prof. Davide Grossi](#).

## B.Sc. of Computer and Autonomous System Engineering





 2014 - 2017

 Sapienza University of Rome, Italy





- **Grade :** 101/110 (GPA 2.97/4).
- **B.Sc. Thesis:** “Comparison Between Segmentation Methods”, under supervision of [Prof. Fiora Pirri](#).
- **Internship :** I completed a 7 months internship (05/2017 - 01 /2018) in the [ALCOR Lab](#) under the supervision of [Dr. Luigi Freda](#) working on the [TRADR EU](#) project.

## CONFERENCES, SUMMER SCHOOLS & WORKSHOPS

### Organizer

- 04/2024    Lead Guest Editor at **MultiTTrust:**    Sepcial Issue at Journal of Interaction Studies    
- 12/2023    Organizer at **MultiTTrust Workshop:**    Multidisciplinary Perspectives on Human-AI Team Trust    
- 07/2023    Organizer at **AI-Mind Workshop at ESSAI:**    R2Net AI Research & Mental Well-Being Workshop    
- 12/2022    Organizer at **Weights and Biases Workshop:**    Workshop at Sapienza University
- 09/2022    Local Chair at **AI4UAM PhD School:**    Artificial Intelligence for Urban Air Mobility    

### Invited Talks

- 11/2023    Speaker at **Fraunhofer IAIS:**    Minds and Machines: Towards Aligned Human-AI Interaction
- 10/2023    Speaker at **CLAIRE Rome Office Launch:**    Safeguarding the Future: Higher Level AI Education    
- 05/2022    Speaker at **Alhub:**    New voices in AI    
- 05/2022    Speaker at **Lightning Talks:**    CLAIRE Rising Researchers Network    
- 01/2021    Speaker at **Sapienza University of Rome:**    Machine Learning Seminars    

### Attendee

- 07/2023 Attendee at **Summer School:** European Summer School on Artificial Intelligence 🔗
- 09/2022 Attendee at **Training School:** Representation mediated Multimodality 🔗
- 01/2022 Attendee at **Winter School:** DeepHealth Winter School 🔗

## Others

- 06/2023 Student Volunteer at **HHAI2023:** Conference on Hybrid Human-Artificial Intelligence 🔗
- 11/2021 Mentee at **Virgilio Project:** Mentoring for Young Entrepreneurs and Start-ups 🔗

## PROFESSIONAL EXPERIENCES

**Lead Developer** 📅 11/2021 - Ongoing 📍 Bayreuth University, Germany

Led the conceptualization, design, and implementation of the [CorpusCompass project](#) within the DFG-funded "[Modernity, Migration and Minorities](#)" research project, resulting in CorpusCompass securing the UvA Research Software Engineering grant (where I am a Co-Principal Investigator) and acceptance at [Clic-IT 2023](#).

**PhD student representative** 📅 11/2021 - 10/2023 📍 Sapienza University, Rome, Italy

Served as a liaison between the PhD student body and the administration, advocating for student needs and fostering a positive learning environment.

**Member of the Department Council** 📅 06/2021 - 10/2023 📍 DIAG, Sapienza University, Rome, Italy

Played a key role in shaping department policies, collaborating with council members and faculty to support departmental success and growth.

**Project Developer** 📅 07/2021 - 07/2022 📍 Rotaract Club, Rome, Italy

Coordinated the [Save Your Life project](#) to raise breast cancer awareness, launching an informative website and organizing public events and outreach.

## COMMUNITY ENGAGEMENT

**CLAIRE|R2net Kernel member** 📅 12/2022 - Ongoing 📍 Online

Promoted to kernel member within [CLAIRE|Rising Researcher Network](#), serving as the first line of contact between CLAIRE and R2Net members.

**Volunteer at ADI** 📅 11/2021 - 01/2024 📍 Rome, Italy

Volunteered with ADI (Associazione dottorandi in Italia) to support fellow doctoral students across Italy, contributing to initiatives aimed at enhancing the doctoral candidate experience.

**Rotaract Club volunteer** 📅 04/2018 - 01/2024 📍 Rome, Italy

As an active member of the [Rotaract Club RTMM](#), worked as an informatics consultant to design and implement technology solutions supporting club initiatives focused on community service and leadership development. I was also the President of the Internal Commission (06/2017 - 06/2018) where I was responsible for internal member coordination and the organization of social events.

**CLAIRE|R2Neet volunteer** 📅 01/2022 - 12/2022 📍 Online

Joined [CLAIRE|Rising Researcher Network](#), aiding in organizing partnerships, social events, and summer schools for Ph.D. students interested in Artificial Intelligence.

**Erasmus Student Network volunteer** 📅 03/2021 - 10/2022 📍 Rome, Italy

Contributed to event planning and coordination, serving as a liaison for incoming Erasmus students, gaining valuable experience in event management and cross-cultural communication.

- 2024 **IROS:** IEEE/RSJ International Conference on Intelligent Robots and Systems
- 2023 **Journal:** AI Communications
- 2023 **EACL:** The 17th Conference of the European Chapter of the Association for Computational Linguistics
- 2022 **CSAE:** The 6th International Conference on Computer Science and Application Engineering
- 2022 **Emergent Communication Workshop:** International Conference on Learning Representations [ICLR]

---

## PUBLICATIONS

---

### Journal Articles

- [1] **N. Brandizzi**, "Toward More Human-Like AI Communication: A Review of Emergent Communication Research". In: *IEEE Access* 11 (2023), pp. 142317–142340. DOI: [10.1109/ACCESS.2023.3339656](https://doi.org/10.1109/ACCESS.2023.3339656).
- [2] S. Pepe, S. Tedeschi, **N. Brandizzi**, S. Russo, L. Iocchi, C. Napoli, "Human Attention Assessment Using A Machine Learning Approach with GAN-based Data Augmentation Technique Trained Using a Custom Dataset". In: *OBM Neurobiology* 06.03 (Sept. 2022), p. 139. ISSN: 2573-4407. DOI: [10.21926/obm.neurobiol.2203139](https://doi.org/10.21926/obm.neurobiol.2203139). URL: <https://doi.org/10.21926/obm.neurobiol.2203139>.
- [3] **N. Brandizzi**, D. Grossi, L. Iocchi, "RLupus: Cooperation through emergent communication in The Werewolf social deduction game". In: *Intelligenza Artificiale* 15 (2021), pp. 55–70. ISSN: 2211-0097. DOI: [10.3233/IA-210081](https://doi.org/10.3233/IA-210081). URL: <https://doi.org/10.3233/IA-210081>.

### Conference Papers

- [4] M. Adnan, **N. Brandizzi**, "CorpusCompass: A Tool for Data Extraction and Dataset Generation in Corpus Linguistics". In: *Proceedings of the 9th Italian Conference on Computational Linguistics*. Ed. by F. Boschetti, G. E. Lebani, B. Magnini, N. Novielli, vol. 3596. CEUR Workshop Proceedings. Venice, Italy: CEUR Workshop Proceedings, 2023, pp. 16–27. URL: <http://ceur-ws.org/Vol-3596/>.
- [5] **N. Brandizzi**, C. Centeio Jorge, R. Cipollone, F. Frattolillo, L. Iocchi, A.-S. Ulfert-Blank, "MULTITRUST: 2nd Workshop on Multidisciplinary Perspectives on Human-AI Team Trust". In: *Proceedings of the 11th International Conference on Human-Agent Interaction*. HAI '23. Available online at <https://multitrust.github.io/2ed/>. Gothenburg, Sweden: Association for Computing Machinery, 2023, pp. 496–497. DOI: [10.1145/3623809.3623978](https://doi.org/10.1145/3623809.3623978). URL: <https://doi.org/10.1145/3623809.3623978>.
- [6] E. Takmaz, **N. Brandizzi**, M. Giulianelli, S. Pezzelle, R. Fernández, "Speaking the Language of Your Listener: Audience-Aware Adaptation via Plug-and-Play Theory of Mind". In: *Findings of the Association for Computational Linguistics: ACL 2023, Toronto, Canada, July 9-14, 2023*. Ed. by A. Rogers, J. L. Boyd-Graber, N. Okazaki, Association for Computational Linguistics, 2023, pp. 4198–4217. DOI: [10.18653/v1/2023.FINDINGS-ACL.258](https://doi.org/10.18653/v1/2023.FINDINGS-ACL.258). URL: <https://doi.org/10.18653/v1/2023.findings-acl.258>.
- [7] **N. Brandizzi**, D. Brunori, A. Trapasso, F. Frattolillo, L. Iocchi, "Mixed Human-UAV Reinforcement Learning: Literature Review and Open Challenges". In: *The International Conference on Cognitive Aircraft Systems (ICCAS)*. 2022. URL: [https://events.isae-supaero.fr/event/14/contributions/367/attachments/32/69/Extended\\_Abstract\\_ICCAS\\_2022.pdf](https://events.isae-supaero.fr/event/14/contributions/367/attachments/32/69/Extended_Abstract_ICCAS_2022.pdf).
- [8] **N. Brandizzi**, A. Fanti, R. Gallotta, S. Russo, L. Iocchi, D. Nardi, C. Napoli, "Unsupervised Pose Estimation by Means of an Innovative Vision Transformer". In: *Artificial Intelligence and Soft Computing - 21st International Conference, ICAISC 2022, Zakopane, Poland, June 19-23, 2022, Proceedings, Part II*. Ed. by L. Rutkowski, R. Scherer, M. Korytkowski, W. Pedrycz, R. Tadeusiewicz, J. M. Zurada, vol. 13589. Lecture Notes in Computer Science. Springer, 2022, pp. 3–20. DOI: [10.1007/978-3-031-23480-4](https://doi.org/10.1007/978-3-031-23480-4). URL: <https://doi.org/10.1007/978-3-031-23480-4>.

### Workshop Papers

- [9] F. Frattolillo, **N. Brandizzi**, R. Cipollone, L. Iocchi, "Towards Computational Models for Reinforcement Learning in Human-AI Teams". In: *Proceedings of the 2nd International Workshop on Multidisciplinary Perspectives on Human-AI Team Trust*. Vol. 3634. CEUR Workshop Proceedings. Gothenburg, Sweden, 2023, pp. 41–51. URL: <https://ceur-ws.org/Vol-3634/>.
- [10] **N. Brandizzi**, L. Iocchi, "Emergent communication in human-machine games". In: *Emergent Communication Workshop at ICLR 2022*. 2022. URL: <https://openreview.net/forum?id=rqLgeQWCXZ9>.
- [11] R. Aureli, **N. Brandizzi**, G. De Magistris, R. Brociek, "A Customized Approach to Anomalies Detection by using Autoencoders". In: *Proceedings of the Scholar's Yearly Symposium of Technology, Engineering and Mathematics (SYSTEM 2021), Catania, Italy, July 27-29, 2021*. Ed. by R. Fazzolari, A. A. Jaber, vol. 3092. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 53–59. URL: <http://ceur-ws.org/Vol-3092/p09.pdf>.
- [12] **N. Brandizzi**, V. Bianco, G. Castro, S. Russo, A. Wajda, "Automatic RGB Inference Based on Facial Emotion Recognition". In: *Proceedings of the Scholar's Yearly Symposium of Technology, Engineering and Mathematics (SYSTEM 2021), Catania, Italy, July 27-29, 2021*. Ed. by R. Fazzolari, A. A. Jaber, vol. 3092. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 66–74. URL: <http://ceur-ws.org/Vol-3092/p11.pdf>.

- [13] **N. Brandizzi**, A. Fanti, R. Gallotta, C. Napoli, “FEFFuL: a Few-Examples Fitness Function Learner”. In: *Proceedings of the Scholar’s Yearly Symposium of Technology, Engineering and Mathematics (SYSTEM 2021)*, Catania, Italy, July 27-29, 2021. Ed. by R. Fazzolari, A. A. Jaber, vol. 3092. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 75–79. URL: <http://ceur-ws.org/Vol-3092/p12.pdf>.
- [14] **N. Brandizzi**, S. Russo, R. Brociek, A. Wajda, “First Studies to Apply the Theory of Mind Theory to Green and Smart Mobility by Using Gaussian Area Clustering”. In: *Proceedings of the International Conference of Yearly Reports on Informatics, Mathematics and Engineering, Online*, July 9, 2021. Ed. by R. Fazzolari, A. A. Jaber, vol. 3118. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 71–76. URL: <http://ceur-ws.org/Vol-3118/p10.pdf>.

## Preprints

- [15] **N. Brandizzi**, “Extended Abstract: Conversational Agents in Human-Machine Interaction, Reinforcement Learning and Theory of Mind in Language Modeling”. In: May 2024, p. 4. DOI: [10.13140/RG.2.2.29722.25287](https://doi.org/10.13140/RG.2.2.29722.25287). URL: [https://www.researchgate.net/publication/380396634\\_Extended\\_Abstract\\_Conversational\\_Agents\\_in\\_Human-Machine\\_Interaction\\_Reinforcement\\_Learning\\_and\\_Theory\\_of\\_Mind\\_in\\_Language\\_Modeling](https://www.researchgate.net/publication/380396634_Extended_Abstract_Conversational_Agents_in_Human-Machine_Interaction_Reinforcement_Learning_and_Theory_of_Mind_in_Language_Modeling).

## Other

- [16] **N. Brandizzi**, “Conversational Agents in Human-Machine Interaction: Reinforcement Learning and Theory of Mind in Language Modeling”. PhD thesis. 2024. URL: <https://hdl.handle.net/11573/1709118>.