Dr. Ing. Nicolo' Brandizzi

Al Researcher Research Scientist @ Fraunhofer IAIS



CONTACTS

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EXPERIENCE

Programming

Python 10 year(s)	•••••	
LaTeX 8 year(s)	•••••	
HPC 5 year(s)	••••	
Bash 8 year(s)	••••	
HTML/CSS 3 year(s)	••••	

Artificial Intelligence

Deep Learning/ ML 8 year(s)	••••
Reinforcement Learning 6 year(s)	••••
NLP / LLMs 6 year(s)	••••
Data Engineer 1 year(s)	••••
Al Governance 1 year(s)	••••

Operating Systems

MacOS 17 year(s)	•••••	
Linux 9 year(s)	••••	
Windows 1 year(s)	••••	

Languages

Italian	Native
English	C1
Spanish	A2
German	A2

INTERESTS



WORK EXPERIENCE

Research Scientist 103/2024 - Present

- **♀** Fraunhofer IAIS, St. Augustin, Germany
- Conducted research and engineered scalable data pipelines for training large language models within the OpenGPT-X and EuroLingua projects, leveraging HPC to optimize data workflows.
- Managed data governance and responsible data practices for the TrustLLM and OpenFLaaS projects.
- Fraunhofer lead in DKZ.2R (Data Reproducibility), coordinating consultancy efforts and organizing hackathons for other work packages.

- Sapienza University of Rome, Italy
- Conducted research on human-AI interaction leveraging hierarchical, model-based reinforcement learning augmented by communication models in the Trust Your Agent Project.
- Contributed to developing computational frameworks enhancing trust and cooperation between humans and AI agents.
- Co-authored publications and presented findings at international workshops, increasing visibility of the project outcomes.

Research Scientist 10/2022 - 04/2023

- Pasis Health, Middletown, USA (Remote)
- Analyzed academic literature on wearable health technologies, directly informing industry innovation strategies.
- Collaborated with interdisciplinary teams to implement new methods for health data analysis, aiming at personalized health improvement.
- Developed reports translating research insights into actionable recommendations, facilitating practical application of theoretical results.

Teaching Assistant 07/2020 - 09/2022

- Sapienza University of Rome, Italy
- Held teaching assistant positions for Tecniche di Programmazione and Seminars in Artificial Intelligence.
- Supported student learning through tutorial sessions, guided practical assignments, and assisted course professors in curriculum development.

Research Collaborator # 07/2021 - 09/2021

Sapienza University of Rome, Italy

- Authored a technical report on "Multi-agent Model-Based Reinforcement Learning" in the scope of MBDA project.
- Applied multi-agent RL techniques to mission planning scenarios, demonstrating potential improvements in automated task coordination.

Ph.D. Engineering in Computer Science	2020 - 2024	Sapienza University of Rome, Italy
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- **Ph.D. Thesis**: "Conversational Agents in Human-Machine Interaction: Reinforcement Learning and Theory of Mind in Language Modeling", under supervision of Prof. Luca locchi 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.
- o 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 locchi.
- o 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 locchi.
- 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.
- o Grade: 101/110 (GPA 2.97/4).
- o B.Sc. Thesis: "Comparison Between Segmentation Methods", under supervision of Prof. Fiora Pirri.
- o 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.

CERTIFICATIONS, GRANTS AND AWARDS

Grants & Fellowships

> EuroHPC Joint Undertaking (EUROHPC-2024-CEI-AI-01): "JUPITER AI Factory NRW"

> Air Force Office of Scientific Research (FA8655-23-1-7257): "Trust your agents: Mixed human-machine cooperation based on model-based, hierarchical, and communication-augmented Reinforcement Learning"

> RWTH Aachen University: ""Future of Al" Summit (expert forum uniting academia and industry)"

> TAILOR Network: "Connectivity Fund (CL.AIRE Rising Research Network on AI and Mental Well-being)"

1 07/2023 **1** €7,200 **2** Awardee **3** [Link]

> University of Amsterdam: "Research Engineering Support Grant (via the UvA Data Science Center)"

∰ 06/2023 ♣ Recipient % [Link]

> COST Action EU: "Multi3Generation Training School (COST Action CA18231)"

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> Sapienza University of Rome: "Multi-agent Model Based Reinforcement Learning,"

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> 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.

Certifications

CONFERENCES, SUMMER SCHOOLS & WORKSHOPS

Organizer

07/2024	Organizer at Al-Mind Workshop 2.0:	R2Net Al Research & Mental Well-Being	g Workshop at ESSAI2024	એ

- 04/2024 Lead Guest Editor at MultiTTrust Special Issue: at Journal of Interaction Studies %
- 12/2023 Organizer at MultiTTrust Workshop: Multidisciplinary Perspectives on Human-Al Team Trust %
- 07/2023 Organizer at Al-Mind Workshop: R2Net Al Research & Mental Well-Being Workshop at ESSAI2023 %
- 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

- 03/2025 Speaker at European Broadcasting Union: Data Technology Seminar %
- 07/2024 Speaker at Al-Mind Workshop 2.0: Advancing Generative and Trustworthy Al: Key Projects at Fraunhofer IAIS. %
- 07/2024 Speaker at Solarpunk Conference: Federated Approaches to Data Challenges in Ethical Al 🔏
- 06/2024 Presenter at 4th TAILOR Conference: Trustworthy AI from lab to market %
- 11/2023 Speaker at Fraunhofer IAIS: Minds and Machines: Towards Aligned Human-Al Interaction
- 10/2023 Speaker at **CLAIRE Rome Office Launch:** Safeguarding the Future: Higher Level AI Education %
- 05/2022 Speaker at Alhub: New voices in Al %
- 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 03/2025
- **♀** Bayreuth University, Germany
- Led programming and software development for CorpusCompass, part of the DFG-funded project "Modernity, Migration and Minorities".
- o Secured the UvA Research Software Engineering Grant (2023).
- Published and presented two peer-reviewed articles at Clic-IT 2023 and Field Matters 2024
- o Supervised two master's students, resulting in successful project completion and their subsequent appointments as student assistants.
- PhD student representative
- 11/2021 10/2023
- **♀** Sapienza University, Rome, Italy

Advocated for PhD students' needs, leading to improved departmental policies on research support and academic resources. Negotiated successfully to provide free AI writing software licenses, directly benefiting 30+ doctoral researchers.

Member of the Department Council

- 06/2021 10/2023
- P 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

Z-Inspection[®] Affiliate

11/2024 - Present

♀ Online

Joining the Z-Inspection® initiative, focused on evaluating trustworthy AI. Contributing to the development of responsible AI assessment frameworks and collaborating with international experts to ensure that AI systems are aligned with ethical standards, human rights, and societal values.

CAIRNE|SIG on Ethical, Legal, and Social Aspects of Al Member

10/2024 - Present

Online

Member of the CAIRNE Special Interest Group on Ethical, Legal, and Social Aspects of Artificial Intelligence. Engaged in:

- Ethical Discussions and Dilemma Reflection: Contributing to discussions on ethical dilemmas in AI, such as bias and fairness, and reflecting on societal impacts of AI technologies.
- Workshops and Seminars: Participating in and contributing to workshops on responsible AI practices and legal compliance.
- **Collaboration on Ethical AI**: Collaborating with group members to integrate ethical, legal, and social aspects into ongoing AI projects, ensuring adherence to European standards.

CAIRNE R2net Kernel member

1 01/2022 - Present

Q Online

After joining the CAIRNE Rising Researcher Network in January 2022, by the end of the same year I was promoted to kernel member, serving as the first line of contact between CAIRNE and R2Net members. Managed a network of 300 students. Involved in:

- **Annual Paper Award**: Organized and promoted a yearly award to showcase outstanding papers by network members on CAIRNE's platforms.
- o Resource Coordination: Managed R2Net's calendar of events, open calls, grants, and handbook.
- Workshops and Events: Coordinated AI research and mental well-being workshops, dissertation support groups, and joint events with ESSAI Summer School.
- **Community Engagement**: Presented a talk on R2Net opportunities and benefits, and launched a private LinkedIn group for enhanced networking and knowledge exchange.

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.

Erasmus Student Network volunteer

03/2021 - 10/2022

Rome, Italy

Organized and coordinated tandem language exchange programs and multiple large-scale events, each attended by over 200 participants. Gained extensive experience in event management, cross-cultural communication, and serving as a primary contact for incoming Erasmus students.

PEER REVIEWS

2024 **Springer Nature:** Autonomous Agents and Multi-Agent Systems

IROS: IEEE/RSJ International Conference on Intelligent Robots and Systems

2023 **Journal:** Al Communications

2023 **EACL:** The 17th Conference of the European Chapter of the Association fo 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.

- [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. URL: https://doi.org/10.21926/obm.neurobiol.2203139.
- [3] **N. Brandizzi**, D. Grossi, L. locchi, "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. URL: https://doi.org/10.3233/IA-210081.

Conference Papers

- [4] G. Contino, R. Cipollone, F. Frattolillo, A. Fanti, **N. Brandizzi**, L. Iocchi, "Modeling a Trust Factor in Composite Tasks for Multi-Agent Reinforcement Learning". In: *Proceedings of the 12th International Conference on Human-Agent Interaction*. HAI '24. Swansea, United Kingdom: Association for Computing Machinery, 2024, pp. 195–203. DOI: 10.1145/3687272.3688325. URL: https://doi.org/10.1145/3687272.3688325.
- [5] 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/.
- [6] **N. Brandizzi**, D. Brunori, F. Frattolillo, A. Trapasso, L. locchi, "Mixed Human-UAV Reinforcement Learning: Literature Review and Open Challenges". In: *Proceedings of the 1st International Conference on Cognitive Aircraft Systems (ICCAS 2022)*. INSTICC. SciTePress, 2023, pp. 38–42. ISBN: 978-989-758-657-6. DOI: 10.5220/0011955100003622.
- [7] N. Brandizzi, C. Centeio Jorge, R. Cipollone, F. Frattolillo, L. Iocchi, A.-S. Ulfert-Blank, "MULTITTRUST: 2nd Workshop on Multidisciplinary Perspectives on Human-Al Team Trust". In: *Proceedings of the 11th International Conference on Human-Agent Interaction*. HAI '23. Available online at https://multittrust.github.io/2ed/. Gothenburg, Sweden: Association for Computing Machinery, 2023, pp. 496–497. DOI: 10.1145/3623809.3623978. URL: https://doi.org/10.1145/3623809.3623978.
- [8] 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. URL: https://doi.org/10.18653/v1/2023.findings-acl.258.
- [9] N. Brandizzi, A. Fanti, R. Gallotta, S. Russo, L. locchi, 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. URL: https://doi.org/10.1007/978-3-031-23480-4.

Workshop Papers

- [10] J. Adler, C. Scholle, D. Buschek, N. Brandizzi, M. Adnan, "User-Centered Design of Digital Tools for Sociolinguistic Studies in Under-Resourced Languages". In: Proceedings of the 3rd Workshop on NLP Applications to Field Linguistics (Field Matters 2024). Ed. by O. Serikov, E. Voloshina, A. Postnikova, S. Muradoglu, E. Le Ferrand, E. Klyachko, E. Vylomova, T. Shavrina, F. Tyers, Bangkok, Thailand: Association for Computational Linguistics, Aug. 2024, pp. 12-27. URL: https://aclanthology.org/2024.fieldmatters-1.3.
- [11] N. Brandizzi, C. C. Jorge, F. Frattolillo, L. Iocchi, A. Ulfert-Blank, eds. Proceedings of the 2nd International Workshop on Multidisciplinary Perspectives on Human-Al Team Trust co-located with 11th International Conference on Human-Agent Interaction (HAI 2023), Gothenburg, Sweden, December 4-7, 2023. Vol. 3634. CEUR Workshop Proceedings. CEUR-WS.org, 2024. URL: https://ceur-ws.org/Vol-3634.
- [12] S. Di Rienzo, F. Frattolillo, R. Cipollone, A. Fanti, **N. Brandizzi**, L. locchi, "Developing Targeted Communication through a Trust Factor in Multi-Agent Reinforcement Learning". In: *Proceedings of HHAI 2024 Workshops*. Ed. by P. Ericson, N. Khairova, M. D. Vos, vol. 3825. CEUR Workshop Proceedings. Published under Creative Commons License Attribution 4.0 International (CC BY 4.0). Malmö, Sweden: CEUR-WS.org, June 2024, pp. 171–175. URL: http://ceur-ws.org/Vol-3825/.
- [13] 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/.
- [14] **N. Brandizzi**, L. locchi, "Emergent communication in human-machine games". In: *Emergent Communication Workshop at ICLR* 2022. 2022. URL: https://openreview.net/forum?id=rqLgeQWCXZ9.
- [15] 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.
- [16] 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.
- [17] 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.

[18] **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

- [19] M. Ali, M. Fromm, K. Thellmann, J. Ebert, A. Arno, R. Rutmann, C. Jain, M. Lübbering, D. Steinigen, J. Leveling, K. Klug, J. Schulze, L. Jurkschat, H. Abdelwahab, B. Jörg, K.-H. Sylla, P. Denisov, N. Brandizzi, Q. Saleem, B. Anirban, C. John, P. Ortiz, M. Ostendorff, A. Jude, L. Manjunath, S. Weinbach, C. Penke, S. Asaadi, F. Barth, R. Sifa, F. Küch, R. Jäkel, G. Rehm, S. Kesselheim, J. Köhler, N. Flores-Herr, Progress Report: Towards European LLMs. 2024. arXiv: 2410.03730 [cs.CL]. URL: https://arxiv.org/abs/2410.03730.
- [20] 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. URL: https://www.researchgate.net/publication/380396634_Extended_Abstract_Conversational_Agents_in_Human-Machine_Interaction_Reinforcement_Learning_and_Theory_of_Mind_in_Language_Modeling.
- [21] N. Brandizzi, H. Abdelwahab, A. Bhowmick, L. Helmer, B. J. Stein, P. Denisov, Q. Saleem, M. Fromm, M. Ali, R. Rutmann, F. Naderi, M. S. Agy, A. Schwirjow, F. Küch, L. Hahn, M. Ostendorff, P. O. Suarez, G. Rehm, D. Wegener, N. Flores-Herr, J. Köhler, J. Leveling, *Data Processing for the OpenGPT-X Model Family*. Oct. 2024. arXiv: 2410.08800 [cs.CL]. URL: https://arxiv.org/abs/2410.08800.

Other

[22] **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.