

Agnese Chiatti, PhD



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Agnese is a **Post-doctoral Research Fellow** at the Artificial Intelligence and Robotics Lab (AIRLab), Politecnico di Milano, Italy. Her main research interests concern the *enhancement of Deep Learning methods with Knowledge Engineering and Knowledge-driven Technologies*. She has obtained a **PhD in Artificial Intelligence** from the Knowledge Media Institute (the Open University, UK). She also holds a **MSc in Information Sciences and Technology (IST)** from Penn State University and a **MSc in Industrial Engineering and Management** from Politecnico di Torino. Agnese has contributed to many EU-funded and US-funded projects, exploring the topic of **knowledge engineering, extraction, and retrieval** from different angles and data sources, ranging from energy consumption data, scholarly data, and ontologies to art collections, digital screenshots, and perceptual data in the context of Computer Vision applications in AI and Field Robotics. In 2022, she was awarded the **L'Oréal-UNESCO for Women in Science Italy prize**, one of only six winners (out of more than 200 applicants) and the only Computer Scientist to be recognised with the award.

Research Interests: Neuro-symbolic AI, Knowledge Representation and Reasoning, Computer Vision, Service and Field Robotics, Knowledge Engineering for AI and Robotics.

Education

Oct 2019 - Sep 2022
Aug 2016 - Aug 2019
Nov 2012 - Sep 2014

PhD in Artificial Intelligence, The Open University (UK) **Awarded on 14/12/2022**
MSc in Information Sciences and Technology, Penn State University (USA)
MSc in Industrial Engineering and Management (Politecnico di Torino, Italy)

Professional experience

June 2023 - Present
Oct 2022 - June 2023
Jan 2022 - Mar 2023
2018 - Sep 2019
Aug 2016 - May 2018
June 2015 - June 2016
Feb 2015 - May 2015

Research Fellow at AIRLab (PoliMI, Italy)
L'Oréal-UNESCO Visiting Fellow at AIRLab (PoliMI, Italy)
Research Assistant at KMi (The Open University, UK) - part time June
Research Assistant at KMi (The Open University, UK) - full time
Research and Teaching Assistant at IST (Penn State University, USA)
Employee in the R&D - Innovation Unit at Hera Group (Italy)
Intern at CRIF - Business Analyst - Decision Solutions team (Italy)

Awards and scholarships

- Awardee of the [L'Oréal-UNESCO for Women in Science Italy prize](#).
- Finalist for the [2022 John McCarthy award for Italian researchers in AI under 35](#).
- 1st place at the 2021 Smart Cities Robotics Challenge - robot shopping cart task
- Awardee of the Open University PhD scholarship to conduct three years of fully funded research at KMi
- Recipient of the Christine Collet Student Participation award at the 2019 EDBT/ICTD conference.

Research projects

Jun 2023 - Present

At AIRLAB (PoliMI), I am contributing to the [AgrifoodTEF European project](#), a 60M euro EU funded initiative (2023-2028) involving partners from 9 EU countries

aimed at providing the first EU-wide Testing and Experimentation Facility for the AI and Robotics solutions in Precision Agriculture such autonomous harvesting, autonomous weeding, and precise plant spraying.

- Oct 2022 - June 2023 Visiting period at AIRLab under the [L'Oreal-UNESCO "For Women in Science" fellowship](#), exploring **Domain Adaptation methods** to handle visual domain shifts in the context of perceptual data collected by **robots in vineyards**.
- Oct 2022 - Mar 2023 At the Knowledge Media Institute (KMi), I have contributed to the [Horizon2020 flagship project GATEKEEPER](#), which has focused on developing smart digital technologies to support health independent living for the **ageing population**. In this context, I have developed **robot vision and semantic mapping** solutions to retrieve personal items in home environments as an **assistive tool** in cases of mild cognitive and visual impairment.
- Oct 2019 - Sep 2022 My PhD research, supervised by [Prof. Enrico Motta](#) and [Dr. Enrico Daga](#), has been focused on contributing a novel framework for developing [Visually Intelligent Agents, i.e., robots that exhibit human-like visual cognition abilities](#). In the proposed framework, **sub-symbolic techniques based on Deep Learning are drastically enhanced by integrating commonsense knowledge** repurposed from external repositories. The validation of this methodology has been primarily focused on the case of [a robot assistant that monitors office environments to detect potential threats to the Health & Safety of employees](#).
- Jan 2022 - Sep 2022 I have contributed to the [Horizon2020 project SPICE \(Social Cohesion, Participation, and Inclusion through Cultural Engagement\)](#), applying **Neuro-symbolic methods to the classification of artistic subjects** in the TATE gallery collection.
- Sep 2016 - May 2018 While working in [Prof. Lee Giles' Lab](#) at PSU, I have been a part of the [Human Screenome project](#), a collaboration between Penn State University and Stanford University. In particular, I have been in charge of implementing an **end-to-end architecture for the extraction and indexing of textual information from smartphone and laptop screenshots**. This platform has allowed researchers in the behavioural and medical sciences to analyse how daily media consumption may affect **fragile user categories**, such as adolescents and low-income groups. Outcomes from this research have been featured in [The New York Times](#), [SAGE Ocean](#), and [Medium](#), among others.
- Aug 2014 - Oct 2014 Visiting MS student at Linköping University (Sweden) while studying at Politecnico di Torino. Under the supervision of Prof. Tania Cerquitelli and Prof. Patrick Lambrix, I developed a novel method based on **data mining and clustering techniques** to reduce the computational cost of **aligning large-scale ontologies**.
- June 2015 - June 2016 While working at the Research & Development unit of HERA, I have been responsible for designing and bootstrapping a data management infrastructure for tracking the energy consumption of urban buildings in the pilot project ["Energy maps for Smart Cities"](#).

Research track record

18 publications, 13 of which are first-authored publications (17 entries and 38 co-authors on Scopus), including the AAAI and AAAI Symposia series, and the International Conference on Principles of Knowledge Representation and Reasoning (KR).

	Google Scholar	Scopus
citations	269	145
h-index	7	6
i10-index	5	-

Peer-reviewed publications:

Chiatti, A., Bertoglio, R., Catalano, N., Gatti, M., and Matteucci, M. (2023). [Surgical fine-tuning for Grape Bunch Segmentation under Visual Domain Shifts](#). In *Proceedings of the 11th European Conference on Mobile Robots (ECMR)*.

Chiatti, A., Bardaro, G., Matteucci, M., and Motta, E. (2023) [Visual Model Building for Robot Sensemaking: Perspectives, Challenges, and Opportunities](#). *Bridge Session on AI and Robotics of the thirty-seventh AAAI conference on Artificial Intelligence (AAAI-23)*.

Chiatti, A., and Daga, E. (2022) [Neuro-symbolic learning for dealing with sparsity in cultural heritage image archives: an empirical journey](#). In *Proceedings of the 21st International Semantic Web Conference - Workshop on Deep Learning for Knowledge Graphs (DL4KG)*. CEUR.

Chiatti, A., Bardaro, G., Motta, E., and Daga, E. (2022) [A Spatial Reasoning Framework for Commonsense Reasoning in Visually Intelligent Agents](#). In *Proceedings of the 8th International Workshop on Artificial Intelligence and Cognition (AIC)*. CEUR.

Bardaro, G., Daga, E., Carvalho, J., Chiatti, A., and Motta, E. (2022) [Introducing a Smart City component in a Robotic Competition: a field report](#). In *Frontiers in Robotics and AI - Smart Sensor Networks and Autonomy*.

Chiatti, A., Motta, E., and Daga, E. (2022) [Robots with Commonsense: Improving Object Recognition through Size and Spatial Awareness](#). In *Proceedings of the 2022 AAAI Spring Symposium on Machine Learning and Knowledge Engineering for Hybrid Intelligence (AAAI-MAKE)*. CEUR.

Chiatti, A. [Towards Visually Intelligent Agents \(VIA\): a Hybrid Approach](#). (2021) In *Proceedings of the European Semantic Web Conference (ESWC) – Satellite Events. PhD Symposium*. Springer.

Chiatti, A., Motta, E., Daga, E., and Bardaro, G. (2021) [Fit to Measure: Reasoning about Sizes for Robust Object Recognition](#). In *Proceedings of the AAAI Spring Symposia - Workshop on Combining Machine Learning and Knowledge Engineering (AAAI-MAKE)*. CEUR.

Chiatti, A., Motta, E., and Daga, E. (2020) [Towards a Framework for Visual Intelligence in Service Robotics: Epistemic Requirements and Gap Analysis](#). In *Proceedings of the 17th International Conference on Principles of Knowledge Representation and Reasoning (KR)*.

Chiatti, A., Bardaro, G., Bastianelli, E., Tiddi, I., Mitra, P. and Motta, E. (2020) [Task-agnostic Object Recognition for Mobile Robots through Few-shot Image Matching](#). In *Electronics. Special Issue on Big Data Analytics for Smart Cities*. 9(3), 380. MDPI.

Reeves, B., Ram, N., Robinson, T.N., Cummings, J. J., Giles, L., Pan, J., Chiatti, A., Cho, M.J. et al. (2019) [Screenomics: A Framework to Capture and Analyze Personal Life Experiences and the Ways that Technology Shapes Them](#). In *Human Computer Interaction*.

Chiatti, A., Bardaro, G., Bastianelli, E., Tiddi, I., Mitra, P. and Motta, E. (2019) [Exploring Task-agnostic, ShapeNet-based Object Recognition for Mobile Robots](#). In *Proceedings of the 3rd International workshop on Data Analytics solutions for Real-Life Applications (DARLI-AP)*. CEUR.

Ul Hoque, M.R., Bradley, D., Kwan, C., Chiatti, A., Li, J. and Wu, J. (2019) [Searching for Evidence of Scientific News in Scholarly Big Data](#). In *Proceedings of the 10th International Conference on Knowledge Capture (K-CAP)*. ACM.

Bardaro, G., Semprebon, A., Chiatti, A., and Matteucci, M. (2019) [From Models To Software Through Automatic Transformations: An AADL To ROS End-to-End Toolchain](#). In *Proceedings of the Third IEEE International Conference on Robotic Computing (IRC)*, 580-585. IEEE.

Chiatti, A., Cho, M. J., Gagneja, A., Yang, X., Brinberg, M., Roehrick, K., Choudhury, S. R., Ram, N., Reeves, B. and Giles, C. L. (2018) [Text Extraction and Retrieval from Smartphone Screenshots: Building a Repository for Life in Media](#). In *Proceedings of the 33rd ACM/SIGAPP Symposium on Applied Computing (SAC)*. ACM.

Chiatti, A., Yang, X., Brinberg, M., Cho, M.J., Gagneja, A., Ram, N., Reeves, B., and Giles, C. L. (2017) [Text Extraction from Smartphone Screenshots to Archive *in situ* Media Behavior](#). In *Proceedings of the 9th International Conference on Knowledge Capture (K-CAP)*. ACM.

Wu, J. Choudhury, S.R., Chiatti, A., Liang, C, and Giles, C.L. (2017) [HESDK: A Hybrid Approach to Extracting Scientific Domain Knowledge Entities..](#) In *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries (JCDL 2017)*. 241- 244. ACM/IEEE.

Chiatti, A., Dragisic, Z., Cerquitelli, T. and Lambrix, P. (2015) [Reducing the search space in ontology alignment using clustering techniques and topic identification](#). In *Proceedings of the 8th International Conference on Knowledge Capture (K-CAP 2015)*. Palisades, NY, USA, October 7-10.

Research monographs:

Chiatti, A. (2022) [Visually Intelligent Agents: Improving Sensemaking in Service Robotics](#). PhD Thesis. The Open University.

Chiatti, A. (2019) [Information Extraction and Retrieval from Digital Screenshots –Archiving in situ Media Behavior](#). Master of Science Thesis. The Pennsylvania State University.

Academic service

- **Organizing Committee:** DEEPFIELD workshop on “Deploying mobile robots in unconstrained real-world environments” at ECMR 2023
- **Assistant Chair:** the 2022 KR Special Session on KR and Robotics
- **PC member:** KR conference (2022, 2023), ISWC 2023 Workshop on Deep Learning for Knowledge Graphs (DL4KG), ISWC 2023 Doctoral Consortium, ICBT workshop on Data Analytics Solutions for Real-life Applications - DARLI-AP (2018-2022).
- **Journal reviewer:** Information Systems Frontiers, Semantic Web Journal Special issue on Cultural Heritage, Semantic Web Journal Special issue on Deep Learning for Knowledge Graphs (DeepL4KGs).
- **Conference reviewer:** ICDAR, TheWebConf, CIKM, CHI

Mentoring and teaching

Mar 2023 - Present	Since joining AIRLab (POLIMI), co-supervised 3 Master Students.
Apr 2022	Instructor of a training course on programming the Nyrion One robotic arm for high-school STEM teachers (Liceo Scientifico Copernico, Bologna).
Jun - Sep 2021	Co-led a team of Master students from AIRLab to participate in the 2021 Smart Cities Robotics Challenge robotic competition as a joint team (Open University - PoliMI). Our team won the shopping cart task, where the robot had to manoeuvre a shopping cart along a given path.
Jun - Aug 2021	Co-advisor of two visiting bachelor students from Amity University (India) on Deep Learning applications for Cultural Heritage.
Jun - Aug 2021	Lead supervisor of a Year 12 student for the KMi Summer Scholarship for Black Asian and Minority Groups (BAME). Project on theoretical and practical aspects of managing RGB-Depth camera sensors with the Robot Operating System (ROS).
Spring term 2018	Teaching Assistant for the IST 441 module – specialty class (for senior-level and graduate-level students) on Information Retrieval and Search Engines.
Fall term 2016	Teaching Assistant for the IST 210 module - sophomore-level required class on Organization of Data, i.e., methods for Database management.

Invited talks and outreach

- **Invited speaker** at different events organised by ITI P. Hensemberger (Monza, Italy) to empower high school students in pursuing STEM careers (2023, 2024).
- **Lecture** on "[Deep Learning for object recognition](#)" at the DEEPFIELD summer school at AIRLab (Nov 2022).
- **Invited talk** "[Making Sense of Sensemaking - Visually Intelligent Robots](#)" at the first [MKAI](#) Lunch & Learn event (Milton Keynes, UK, May 2022).
- **Invited research role model** for the weekly live Q&A with [STEMettes](#), an award-winning social enterprise in the UK working to inspire and support young women and non-binary people in STEM careers (Apr 2022).
- **Invited panellist** on the theme of Women, Technology and Innovation ("[Donne, Tecnologia e Innovazione](#)"), for the 160th anniversary of the foundation of Politecnico di Torino (Nov 2019).
- **Invited talk** "How Deep Learning paradigms might inform Screenome construction" at the Department of Communication, Stanford University (May 2018).

Organisational skills and social advocacy

- Co-host of the [KMi Maven of the Month series](#), a series of virtual Q&A sessions with top-experts in AI, to promote an open discussion of broad socio-technical topics (e.g., AI & Ethics, Digital Misinformation, and others) with a diverse audience from different departments within the Open University.
- **Member of the Athena Swan self-assessment team (SAT)** from 2020 to 2022, promoting gender equality, diversity, and inclusion at the Knowledge Media Institute (KMi), contributing to winning [the Athena Swan Silver Award for my organisation in 2022](#).
- **Volunteering Program Coordinator** at the 1st EU Smart Cities Robotics Challenge in 2019, the first European Robotic League (ERL) competition to be held in a public shopping centre. During the event, I have also been in charge of managing all social media channels for the organising institution.