# Agnese Chiatti, PhD

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I am a L'Oréal-UNESCO Fellow at AIRLab, Politecnico di Milano (Italy). I am also working as a part-time Research Assistant at the Knowledge Media Institute (the Open University, UK), where I obtained my PhD degree in Artificial Intelligence. I hold a M.S. in Information Sciences and Technology (IST) from the Pennsylvania State University.

**Research Interests**: AI, Computer Vision, Service and Cognitive Robotics, Knowledge Engineering, Hybrid Intelligence, Neurosymbolic Learning.

## ⬡ EDUCATION

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|---|---|
| 2019 – 2022 | **PhD in Artificial Intelligence** at KMi (the Open University, UK) |
| 2016 – 2019 | **Master of Science** in Information Sciences and Technology at PSU |
| 2012 – 2014 | **Master of Science** in Industrial Engineering and Management (Computer Engineering minor) at Politecnico di Torino – Italy |

## ⬡ CAREER

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|---|---|
| Oct '22 – Present | **L'Oréal-UNESCO Visiting Fellow** at Politecnico di Milano, Italy |
| Jan '22 – Present | **Part-time Research Assistant** at KMI, the Open University, UK |
| Jun '18 – Sep 19 | **Research Assistant** at KMI, the Open University, UK |
| Aug '16 – May'18 | **Research and Teaching Assistant** at Penn State University |
| Jun '15 – Jun '16 | Employee in the **R&D – Innovation Unit** at Hera Group - Italy |
| Feb '15 – Jun '15 | Intern at CRIF – **Business Analyst – Decision Solutions** – Italy |

## QUALITY OF SCIENTIFIC PRODUCTION

**16 publications**, **11** of which are **first-authored publications** (**14 entries** and **35 co-authors**, according to Scopus).

- Author/Co-author of **3 Q2 journal papers** based on SCIMAGO.
- Author/Co-author of **13 publications on peer-reviewed venues**, including **1 top-level A++/A+ conference**, based on the GII-GRIN-SCIE ranking: the International Conference on Principles of Knowledge Representation and Reasoning (KR).

|            | Google Scholar | Scopus |
|------------|----------------|--------|
| citations  | 201            | 99     |
| h-index    | 7              | 4      |
| i10-index  | 4              | -      |

## TALKS AND SEMINARS

**Nov 2022**   Lecture on "Deep Learning for object recognition" at the DeepField summer school, organised at AIRLab (Politecnico di Milano).

**May 2022**   Talk titled "Making Sense of Sensemaking - Visually Intelligent Robots" at the first MKAI Lunch & Learn event.

**April 2021**   Invited as *a research role model for the weekly live Q&A with STEMettes*, an award-winning social enterprise working to inspire and support young women and non-binary people in STEM careers.

**Nov 2019**   Invited panelist on the theme of Women, Technology and Innovation (*"Donne, Tecnologia e Innovazione"*), for the 160th anniversary of the foundation of Politecnico di Torino.

**May 2018**   Seminar titled "How Deep Learning paradigms might inform Screenome construction" at the Dept. of Communication, Stanford University.

## CURRENT RESEARCH PROJECTS

- At AIRLAB, I am working on visually intelligent robotic applications in the context of monitoring crops for precision agriculture and for the autonomous exploration of complex and risky environments (e.g., underground pipelines).

- At KMi, I am contributing to the [Horizon2020 European project GATEKEEPER](#), which is aimed at developing novel Robotic and Smart Home solutions to support healthy independent living for the ageing population.

## PREVIOUS RESEARCH PROJECTS

**Oct 2019 - Sep 2022**
My PhD research 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, state-of-the-art Deep Learning techniques are enhanced by integrating different knowledge-based reasoners – e.g., modules that consider the typical size and spatial relations of objects. I have evaluated the proposed methodology in the scenario of [a robot assistant that monitors unconstrained and dynamic office environments to detect potential threats to the Health & Safety of employees](#).

**Jan – Sep 2022**
I have contributed to the Horizon2020 European project [SPICE (Social Cohesion, Participation, and Inclusion through Cultural Engagement)](#) as a part-time Research Assistant, under the supervision of [Dr. Enrico Daga.](#) I have explored the use of Neurosymbolic Learning methods for classifying artistic subjects from cultural heritage image collections.

**Jun – Sep 2021**
Collaboration with [AIRLab](#) (Politecnico di Milano, Italy). Co-led a team of Master students from Polimi to participate to the [2021 Smart Cities Robotics Challenge](#) (SciRoc) robotic competition. Our team won the shopping cart task, where the robot had to manoeuvre a shopping cart along a pre-defined route.

**Jun 2018 - Sep 2019**
As a full-time Research Assistant at KMi (the Open University, UK), I implemented Deep Learning methods to recognise objects from robot-collected sensor data, under the supervision of [Prof. Enrico Motta](#), Dr. Emanuele Bastianelli and [Dr. Ilaria Tiddi](#).

**2016 - 2018**
I have been a part of the [Human Screenome project](#), a collaboration between the Colleges of Information Sciences and Technology, Human Development and Family studies at Penn State, and the Depts. of Communication and Medicine at Stanford University. I have been responsible of implementing a complete architecture for the extraction and indexing of textual information from digital screenshots taken from the smartphone and laptop devices. The platform I implemented has allowed researchers in the behavioral and medical sciences to analyze

how daily media consumption may affect the users' behavior, particularly in the case of fragile categories, such as adolescents and low-income groups.

**2015 - 2015** Member of the Research & Development team at HERA Group, where I have been part of a Smart City pilot project aimed at implementing user dashboards to track the energy consumption of urban buildings, i.e., energy maps.

**Aug – Sep 2014** Visiting Master student at Linköping University (Sweden) in the Division for Database and Information Techniques, for conducting experimental research activities for my Master Thesis. Under the supervision of [Prof. Tania Cerquitelli](#) (Politecnico di Torino) and [Prof. Patrick Lambrix](#) (Linköping University), I devised a novel method to mitigate the computational cost of aligning large-scale ontologies, through clustering techniques.

⬡  AWARDS AND SCHOLARSHIPS

- Finalist for the [2022 John McCarthy award](#) for Italian researchers in AI under 35.
- Awardee of the [2022 L'Oréal-UNESCO for Women in Science Italy scholarship.](#)
- Recipient of the Christine Collet EDBT/ICDT Student Participation Award to attend [the 2019 International joint EDBT/ICTD conference](#).
- Selected to participate in the [2018 CRA-W Grad Cohort workshop](#).

⬡  ACADEMIC SERVICE

- **Assistant Chair** for the [KR2022 Special Session on KR and Robotics](#)
- **PC member:** KR conference (2022, 2023)**,** [DARLI-AP workshop ](#)(2018-2022).
- **Journal reviewer:** Information Systems Frontiers, Semantic Web Journal Special issues on Cultural Heritage and Deep Learning for Knowledge Graphs (DeepL4KGs).
- **Conference reviewer**: ICDAR, TheWebConf, CIKM, CHI

⬡  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 Artificial Intelligence, to promote an open discussion of broad sociotechnical topics (e.g., AI & Ethics, Digital Misinformation, and others) with a diverse audience from different disciplines and backgrounds.

- Member of **KMi's Athena Swan self-assessment team (SAT)** from 2020 to 2022, promoting gender equality, diversity, and inclusion at KMi.
- **Co-organiser of the 2021 Edition of the CRC PhD student conference**, for PhD students of KMi and of the School of Computing and Communications.
- Part of the organizing team of the 1st edition of the [Smart Cities Robotics Challenge (2019)](#), where I **coordinated the local volunteering program** required to run the public event in the Milton Keynes Central Shopping Center.

## MENTORING AND TEACHING

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|---|---|
| **April 2022** | Instructor of a 5-hour training course to prepare high-school teachers (Liceo Scientifico Copernico, Bologna, Italy) to use the [Niryo One](#) robotic arm in STEM school laboratory activities. |
| **Jun - Aug 2021** | Co-supervisor of two visiting Bachelor Students from Amity University (India) on applications of Deep Learning and Knowledge Engineering 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)](#) on a 6-week project. The project was aimed at providing both theorical and practical fundamentals for processing sensory data through the Robot Operating System (ROS). |
| **Spring term 2018** | Teaching Assistant for the Penn State IST 441 module – specialty class (for senior-level and graduate-level students) on Information Retrieval and Search Engines offered to senior undergraduate and graduate students. |
| **Fall term 2016** | Teaching Assistant for the Penn State IST 210 module - sophomore-level required class on Organization of Data, i.e., methods for Database management. |

## PEER-REVIEWED PUBLICATIONS

In the following list of publications, the conference ranking based on GGS, and the journal impact based on SCIMAGO are also indicated, where available.

🔵 Journal    🟠 Conference    🟢 Book/Thesis

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

**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*. **[rank Q2 – IF 4.33]**

**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)*. **[rank A+]**

**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. **[rank Q2 – IF 2.397]**

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.* **[rank Q2 – IF 4.75]**

**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. **[rank B]**

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. **[rank B]**

**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. **[rank B]**

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*. **[rank B]**

**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. **[rank B]**

## TECHNICAL SKILLS

**Object-oriented programming:** Python (advanced level), Java, R, Matlab, C++ (very basic level).

**Image Processing:** OpenCV (2D), Open3D (3D).

**Deep Learning:** PyTorch, Tensorflow Lite, Google Pycoral Edge TPU, Keras.

**Robotics:** Robot Operating System (ROS), rosbag data/logs manipulation in Python.

**Data Analysis:** SQL (SQLServer), MongoDB, Excel VBA, MS Access, RapidMiner.

**Geographic/Spatial Information Systems:** PostGIS, PostGRESQL, Esri ArcGIS, QGIS.

**Information Retrieval:** Apache Solr + ElasticSearch Lucene, Heritrix (Web crawling).

**Ontologies:** RDF, OWL format, JSON for Linked data (JSON-LD).

**Web Design:** HTML, CSS, Django, SQL+PHP, Javascript

**Cloud Systems:** Google Cloud Computing (VM setup), Docker.