Agnese Chiatti, PhD

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Agnese is a L'Oréal-UNESCO Visiting Fellow at AIRLab, Politecnico di Milano (Italy). She has obtained a PhD in Artificial Intelligence from the Knowledge Media Institute (the Open University, UK). Agnese holds a M.S. in Information Sciences and Technology (IST) from the Pennsylvania State University and a M.S. in Industrial Engineering and Management from Politecnico di Torino.

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

EXPERIENCE

Oct '22 – Present	**L'Oréal-UNESCO Visiting Fellow** at Politecnico di Milano, Italy
Jun '18 – Mar'23	**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

EDUCATION

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

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 prize.
- 1st place at the 2021 Smart Cities Robotics Challenge - robot shopping cart task
- Awardee of the 2019 Open University PhD scholarship to conduct three years of fully funded postgraduate research at the Knowledge Media Institute.
- Recipient of the Christine Collet EDBT/ICDT Student Participation award at the 2019 International joint EDBT/ICTD conference.

CURRENT RESEARCH PROJECTS

- At AIRLAB, Agnese is working on robot vision applications in the context of precision farming, under the L'Oreal-UNESCO "For Women in Science" fellowship.

PREVIOUS RESEARCH PROJECTS

Oct 2022 – Mar 2023 At KMi, Agnese has contributed to the Horizon2020 European project GATEKEEPER, where she is developing robot vision solutions for personal item retrieval in home environments.

Oct 2019 - Sep 2022 Agnese's 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 drastically enhanced by integrating different knowledge-based reasoners, through a Neuro-symbolic learning approach. This work has been validated in the scenario of a robot assistant that monitors office environments to detect potential threats to the Health & Safety of employees.

Jan – Sep 2022 Agnese has contributed to the Horizon2020 European project SPICE (Social Cohesion, Participation, and Inclusion through Cultural Engagement), under the supervision of Dr. Enrico Daga. She has applied Neurosymbolic Learning methods to the classification of artistic subjects in the TATE gallery collection.

2016 - 2018 Agnese has 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. She has been responsible for implementing an end-to-end architecture for the extraction and indexing of textual information from digital

screenshots. The platform implemented by Agnese 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 As a member of the Research & Development team at HERA Group, Agnese has contributed to a Smart City pilot project aimed at tracking the energy consumption of urban buildings through digital dashboards and data analytics tools.

Aug – Sep 2014 Visiting Master student at Linköping University (Sweden) in the Division for Database and Information Techniques. Under the supervision of Prof. Tania Cerquitelli (Politecnico di Torino) and Prof. Patrick Lambrix (Linköping University), Agnese has devised a novel method based on clustering methods for mitigating the computational cost of aligning large-scale ontologies.

QUALITY OF SCIENTIFIC PRODUCTION

17 publications, **12** of which are **first-authored publications** (**15 entries** and **35 co-authors**, according to Scopus).

- Author/Co-author of **3 Q2 journal papers** based on SCIMAGO.
- Author/Co-author of **14 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	220	106
h-index	7	4
i10-index	5	-

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., 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.** (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]**

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

TALKS AND EXTERNAL OUTREACH

Feb 2023 Invited talk at the SHESTEM event organized by ITI P. Hensemberger (Monza, Italy) to empower high school students in pursuing STEM careers.

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

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

April 2021 Invited *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.

MENTORING AND TEACHING

April 2022 Instructor of a training course on programming the Niryo One robotic arm for high-school STEM teachers at Liceo Scientifico Copernico (Bologna, Italy).

Jun -Sep 2021 Co-led a team of Master students from AIRLab (Politecnico di Milano, Italy) at the 2021 Smart Cities Robotics Challenge (SciRoc) robotic competition. The 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). The project covered the theorical and practical aspects of managing RGB-Depth camera sensors 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.
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.

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.

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.