Agnese CV Chiatti

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I am a **PhD Student** at the Knowledge Media Institute (the Open University, UK), working under the supervision of Prof. Enrico Motta and Dr. Enrico Daga. I hold a M.S. in Information Sciences and Technology (IST) from the Pennsylvania State University, where I have worked with Profs. Lee Giles, Nilam Ram and Prasenjit Mitra.

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

EDUCATION

2019 – Present	**PhD Student** 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

CAREER

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	Member of 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

14 publications, **9** of which are **first-authored publications** (**12 entries** on Scopus and **34 co-authors**, according to Scopus).

- Author/Co-author of **3 Q2 journal papers** based on SCIMAGO.
- Author/Co-author of **11 publications on peer-reviewed conferences**, 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	147	61
h-index	6	4
i10-index	4	-

TALKS AND SEMINARS

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.

March 2020 Seminar titled *"Is what you see really what you get? Improving robot sensemaking through Visual Intelligence"* at the Knowledge Media Institute, The Open University.

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.

April 2018 Seminar titled "Text extraction and retrieval from digital screenshots – Towards building a repository for life in media" at the QuantDev Methodology Lab, the Pennsylvania State University.

CURRENT RESEARCH PROJECTS

- My PhD research is 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 to categorise them. I am evaluating 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.

- Since January 2022, I have joined 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. My role concerns the application of a combination of Deep Learning-based and knowledge-enhanced methods to facilitate knowledge discovery from image collections that depict artworks and museum artifacts.

PREVIOUS RESEARCH PROJECTS

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 maneuver a shopping cart along a pre-determined route.

Jun – Sep 2019 Part of the organizing team of the 1st edition of the Smart Cities Robotics Challenge, where I coordinated the local volunteering program required to run the public event, which was held in Milton Keynes Central Shopping Center. I was also in charge of managing the promotion of the event through social media channels. Lessons learned from this experience were recently published as a journal field report.

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.

Oct – Nov 2018 At KMi, I have also worked with Dr. Pinelopi Troullinou to complete the final evaluation phase of the European project Analytics for Everyday Learning (AFEL). The goal of this evaluation was to investigate how users can reach informal and collective learning through online platforms.

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 laptops of the participants to the study. The platform I implemented has allowed researchers in the behavioral and medical sciences to analyze how daily media consumption may affect users' behavior, particularly in the case of fragile categories, such as adolescents and low-income groups. This work contributed to the production of several prestigious journal and conference publications and to the award of my MS degree at Penn State.

2016 - 2017 In Prof. Lee Giles' Lab, I have collaborated with Drs. Jian Wu and Sagnik Ray Chodhoury for the development of an automated component for the extraction of scientific keywords from scholarly data.

2015 - 2015 Member of the Research & Developmen team at HERA Group, where I have been part of a Smart City pilot project aimed at implementing an innovative dashboard 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. During the visiting, I have conducted 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 the use clustering methods.

ACADEMIC SERVICE

- **Assistant Chair** for the KR2022 Special Session on KR and Robotics
- **PC member:** KR conference (2022), DARLI-AP workshop (since 2018).
- **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

AWARDS AND SCHOLARSHIPS

- Recipient of the KMi PhD scholarship since 2019, to conduct three years of fully funded research in Artificial Intelligence.
- Recipient of the Christine Collet EDBT/ICDT Student Participation Award to attend the 22nd International joint EDBT/ICTD conference, to be hold on March 25-29, 2019, in Lisbon, Portugal.

- Selected to participate in the 2018 CRA-W Grad Cohort workshop on April 12-14, 2018, in San Francisco, CA.

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 the **Athena Swan self-assessment team (SAT),** that promotes gender equality, diversity, and inclusion at KMi.
- **Co-organiser of the 2021 Edition of the CRC PhD student conference**, a yearly forum for PhD students in KMi and in the School of Computing and Communications to present their work.

MENTORING AND TEACHING

Jun - Aug 2021	Co-supervisor, with Dr. Enrico Daga, 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, supervised by Dr. Gianluca Bardaro and me, was aimed at providing both theorical and practical fundamentals for processing sensory data through the Robot Operating System (ROS).
Oct 2020 – April 2021	Lead supervisor of a visiting intern at KMi, on an Introductory project to Machine Learning for Vision and Image Segmentation.
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

- Bardaro, G., Daga, E., Carvalho, J., **Chiatti, A.**, and Motta, E. Introducing a Smart City component in a Robotic Competition: a field report. To appear in *Frontiers in Robotics and AI - Smart Sensor Networks and Autonomy*. 2022. **[rank Q2 – IF 4.33]**

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

- **Chiatti, A.** Towards Visually Intelligent Agents (VIA): a Hybrid Approach. In *Proceedings of the 2021 ESWC Conference – Satellite Events. PhD Symposium*. Springer.

- **Chiatti, A.**, Motta, E., Daga, E., and Bardaro, G. Fit to Measure: Reasoning about Sizes for Robust Object Recognition. In *Proceedings of the 2021 AAAI Spring Symposia - Workshop on Combining Machine Learning and Knowledge Engineering (AAAI-MAKE 2021)*. 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 2020)*. **[rank A+]**

- **Chiatti, A.**, Bardaro, G., Bastianelli, E., Tiddi, I., Mitra, P. and Motta, E. Task-agnostic Object Recognition for Mobile Robots through Few-shot Image Matching. 2020. 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. *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. 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 2019)*. CEUR.

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

- Bardaro, G., Semprebon, A., **Chiatti, A.**, and Matteucci, M. 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. 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 2018)*. Pau, France. April 9-13, 2018. **[rank B]**

- **Chiatti, A.,** Yang, X., Brinberg, M., Cho, M.J., Gagneja, A., Ram, N., Reeves, B., and Giles, C. L. Text Extraction from Smartphone Screenshots to Archive *in situ* Media Behavior. In *Proceedings of the 9th International Conference on Knowledge Capture (K-CAP 2017)*. Austin, TX, USA. December 4-6, 2017. **[rank B]**

- Wu, J. Choudhury, S.R., **Chiatti, A.**, Liang, C, and Giles, C.L. 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. Toronto, ON, Canad a, June 19-23, 2017. **[rank B]**

- **Chiatti, A.,** Dragisic, Z., Cerquitelli, T. and Lambrix, P. 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, 2015. **[rank B]**

TECHNICAL SKILLS

Object-oriented programming: Python (advanced level), Java + {Java in Android SDK}, R, Matlab, C++ (very basic level).

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

Machine Learning: Scikit-learn, Pytorch, Tensorflow Lite (Edge TPU devices – Google Pycoral), and Keras for Deep Learning.

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 (storage, UNIX-based Virtual Machine setup and package installations), building Docker images for remote servers (CPU and GPU environments).