# Antonio **Andriella**

Ph.D Candidate · Al Engineer

Institut de Robotica i Informatica Industrial, Parc Tecnològic de Barcelona. C/ Llorens i Artigas 4-6, Barcelona, 08028, Spain 1+34 665 88 69 03 | 🕿 aandriella@iri.upc.edu | 🏶 antonioandriella.com | 🗖 aandriella | 🖬 antonio-andriella

### **Research Interests**

Robotics, human-centered design, machine learning, artificial intelligence, human-robot interaction, adaptive and personalized systems, reinforcement learning, automated planning, socially assistive robotics.

### Education \_\_\_\_

Polytechnic University of Catalonia Рн.D (Аитоматіс Солтвоь, Robotics & Vision) • Thesis title: Personalized Robot-Assisted Cognitive Training for patients with dementia • Thesis supervisors: Dr. Guillem Alenyà, Prof. Carme Torras	Barcelona, Spain expected beginning of 2022
University of Rome, La Sapienza	Rome, Italy
<ul> <li>MASTER IN ARTIFICIAL INTELLIGENCE (WITH HONOURS)</li> <li>Thesis title: Multi-Objective Planning in Situation Calculus</li> <li>Thesis score: 110 cum laude/110</li> <li>Thesis supervisors: Prof. Daniele Nardi and Dr. Vittorio Ziparo</li> </ul>	2007 - 2009
University of Rome, La Sapienza	Rome, Italy
<ul> <li>BACHELOR IN COMPUTER ENGINEERING</li> <li>Thesis title: Analysis and Evaluation of SIFT Algorithm</li> <li>Thesis score: 99/110</li> <li>Thesis supervisor: Prof. Fiora Pirri</li> </ul>	2004 - 2007

### **Publications**

- [9] A. Suárez, **A. Andriella**, A. Taranović, J. Segovia, C. Torras and G. Alenyà. *Automatic Learning of Cognitive Exercises for Socially Assistive Robotics*. 30th IEEE International Symposium on Robot and Human Interactive Communication, 2021.
- [8] A. Andriella, H. Siqueira, Di Fu, S. Magg, P. Barros, S. Wermter, C. Torras and G. Alenyà Do I Have a Personality? Endowing Care Robots with Context-Dependent Personality Traits. International Journal of Social Robotics, 2020.
- [7] A. Andriella, R. Huertas-García, S. Forgas-Coll, C. Torras and G. Alenyà. Discovering SOCIABLE: Using a Conceptual Model to Evaluate the Legibility and Effectiveness of Backchannel Cues in an Entertainment Scenario.
   29th IEEE International Symposium on Robot and Human Interactive Communication, 2020.
- [6] **A. Andriella**, C. Torras and G. Alenyà. *Cognitive System Framework for Brain-Training Exercise based on Human-Robot Interaction*. Cognitive Computation 12, 793–810, 2020.
- [5] **A. Andriella**, C. Torras and G. Alenyà. *Short-Term Human–Robot Interaction Adaptability in Real-World Environments*. International Journal of Social Robotics 12, 639–657, 2019.
- [4] **A. Andriella**, A. Suárez, J. Segovia, C. Torras and G. Alenyà. *Natural teaching of robot-assisted rearranging exercises for cognitive training*, 11th International Conference on Social Robotics, 2019, Madrid, in Social Robotics, Vol 11876 of Lecture Notes in Artificial Intelligence, pp. 611-621, Springer.
- [3] **A. Andriella**, C. Torras and G. Alenyà. *Learning robot policies using a high-level abstraction persona-behaviour simulator*, 28th IEEE International Symposium on Robot and Human Interactive Communication, 2019.
- [2] **A. Andriella**, J. Lobo, C. Torras and G. Alenyà. *Robot interaction adaptation for healthcare assistance*, 2019 Workshop on Artificial Intelligence & Robotics in Service Interactions, 2019, Zaragoza, pp. 159-172.
- [1] **A. Andriella**, G. Alenyà, J. Hernández-Farigola and C. Torras. *Deciding the different robot roles for patient cognitive training*. International Journal of Human-Computer Studies, 117, 20-29, 2018.

### Honors & Awards \_\_\_\_\_

#### Research

2017-2020	Marie Curie Fellowship (ITN H2020 721619), Institut de Robotica i Informatica Industrial, CSIC - UPC	Barcelona, Spain
2019	"Show my research" contest, Marie Curie Alumni Association and Vikki Accademy	
2019	Second Prize to the best diffusion work, The Catalan Association for Artificial Intelligence	Catalunya, Spain

# Work Experience

#### **Artificial Intelligence Lead**

#### COGISEN

Worked on developing a set of machine learning algorithms aiming to go beyond the current limitations. The algorithms had been used for gaze tracking technology with RGB cameras as well as for image and video compression. The platform I worked on, allowed for the quick creation of models to capture and follow specific sparse changes of information in the frequency domain. Outcome.

- Designed, developed and deployed new machine learning algorithms.
- Applied and validated the developed algorithms to real-world scenarios.
- Gained knowledge in frequency domain algorithms.
- Worked in a dynamic and fast-paced team with top experts.

#### **Artificial Intelligence Expert**

#### COGISEN

Worked on the first gaze tracking solution for an F1 simulator at Ferrari. Furthermore, developed a silhouette detection pipeline for a kart simulator for a Ferrari Driver Academy pilot.

Outcome:

- Gained and strengthened knowledge in using OpenCV library as well as Matlab Simulink.
- Developed face and eye detection algorithms based on Viola Jones method as well as eye shapes based on Active Shape Model.
- Prototyped a 3D gaze tracking solution using stereo vision to estimate the position of eyes on the screen.
- Worked in close collaboration with the programming and electronics leads.

#### **Artificial Intelligence Consultant**

COGISEN

Analysed and evaluated the opportunity to introduce artificial intelligence into the automotive market. Outcome:

- Offered strategic support on the next generation of smart sensors.
- Produced reports, with strong analysis on machine learning and data mining state of the art algorithms.

### **Research Experience**

### Developing an Adaptive and Personalized Social Robot for Older Adults with Cognitive

#### Impairments

INSTITUT DE ROBOTICA I INFORMATICA INDUSTRIAL, CSIC-UPC

Designing and developing a fully autonomous personalised-robot assisted cognitive training for patients affected by cognitive impairment. The social robot is adaptive, that is, it is capable of providing personalised adaptation to the individual's unique needs. Furthermore, the social robot is adaptable, that is, therapists can customise its characteristics and initial behaviour according to the specific patient. Evaluation of the robotic system in a healthcare centre with 22 patients affected my mild cognitive impairment and mild dementia.

Master Project: Multi-Objective Planning in Situation Calculus in a Rescue Scenario

UNIVERSITY OF ROME, LA SAPIENZA

Studied the generation of rational behaviors through the planning of actions for teams of robots that follow different objectives. The thesis work consisted of three different activities: i) formalize the domain in Situation Calculus, ii) formulate an approach to find a solution that takes into account both the cooperative aspect of the team as well as the conflict situations, iii) validate the proposed approach on a rescue scenario.

#### Bachelor Project: Evaluating Scale-Invariant Feature Transform (SIFT) Classifier

UNIVERSITY OF ROME, LA SAPIENZA Analysis and evaluation of the object recognition algorithm, SIFT.

### Research Visits

feb-mar 2021 University of Naples, Federico II, Department of Electronic Engineering and Information Technology (DIETI)		Italy
		nuty
nov-dec 2018	University of Hamburg, Department of Informatics, Knowledge Technology (WTM)	Germany
jun 2019	University of Hamburg, Department of Informatics, Knowledge Technology (WTM)	Germany

3

#### Rome, Italy

Rome, Italy 2010 - 2012

Rome, Italy 2009 - 2010

### Rome, Italy

2017 - Present

2010 - 2012

Rome, Italy

2006

### Skills\_\_\_\_\_

Robotics/hardware platforms	ROS, Nao, TIAGo, WAM
Software/IDEs	Git, PyCharm, Visual Studio, CLion
Programming	Python, Matlab, Java, C++, HTML, git, LaTeX, PDDL, Prolog

# Academic Organization \_\_\_\_\_

Workshop: International Conference on Robot and Human Interactive Communication	Virtual
Co-organiser	2021
Behavior Adaptation Interaction and Learning for Assistive Robotics (BAILAR):	
https://sites.google.com/view/bailar-2021	
Workshop: ACM/IEEE International Conference on Human-Robot Interaction	Virtual
Co-organiser	2021
The Road to a successful HRI: AI, Trust and ethicS (TRAITS):	
https://sites.google.com/view/traits-hri/home	
Workshop: International Conference on Robot and Human Interactive Communication	Naples, Italy
Main organiser	2020
Quality of Interaction in Socially Assistive Robotics (QISAR):	
https://sites.google.com/view/qisar-roman20	
Workshop: International Conference on Social Robotics	Madrid, Spain
Co-organiser	2019
Quality of Interaction in Socially Assistive Robotics (QISAR):	
https://sites.google.com/view/qisar-icsr19	
Special Issue: International Journal of Social Robotics	
GUEST EDITOR	2021
The road to successful HRI: trust, acceptance, ethics, social signals and AI	
Special Issue: Benjamins, Interaction Studies	
GUEST EDITOR	2020
Interaction Quality in Human-Robot Interaction	
Special Issue: Paladyn, Journal of Behavioral Robotics	
GUEST EDITOR	2019
Quality of Interaction in Socially Assistive Robotics	

### Conference and Journal Service

2021	Associate Editor IEEE/RSJ International Conference on Intelligent Robots and Systems
2021	Reviewer International Conference on Robot and Human Interactive Communication
2021	Reviewer User Modeling and User-Adapted Interaction
2021	Reviewer International Journal of Social Robotics
2020	Reviewer International Journal of Social Robotics
2020	Reviewer IEEE Robotics and Automation Letters, RA-L
2020	Reviewer Paladyn, Journal of Behavioural Robotics
2020	Reviewer International Conference on Social Robotics
2019	Reviewer International Journal of Social Robotics
2019	Reviewer International Conference on Social Robotics
2019	Reviewer IEEE Transactions on Cognitive and Developmental Systems
2019	Reviewer International Conference on Automated Planning and Scheduling
2018	Reviewer International Conference on Social Robotics
2018	Reviewer International Conference on Robotics and Automation
2017	Reviewer International Conference on Robotics and Automation

# Workshop and Summer School Attended

June 2017	Cognitive Robotics
May 2018	User-centred research
June 2018 April 2019 Nov 2019	Planning and Scheduling Robots for Older Adults Business Orientation Training

MIT (Boston) Ben Gurion University Tu Delft) Orebro University Bristol University

# Conferences Attended

2021	International Conference on Intelligent Robots and Systems	Virtual
2020	AAAI Conference on Artificial Intelligence	Virtual
2020	International Conference on Robotics and Automation	Virtual
2020	International Conference on Robot & Human Interactive Communication	Virtual
2020	International Conference on Social Robotics	Virtual
2019	International Conference on Social Robotics	Madrid
2019	International Conference on Robot & Human Interactive Communication	New Deli

# Languages\_\_\_\_\_

Italian	native language
English	fluent: written and spoken
Spanish	fluent: written and spoken

# References\_\_\_\_\_

Dr.	Gui	llem	Aleny	yà
-----	-----	------	-------	----

IRI,	(CSIC-L	JPC)
		- · ·

galenya@iri.upc.edu
 +34 93 4011901

Prof. Carme Torras IRI, (CSIC-UPC) @ torras@iri.upc.edu \$ +34 93 4015790