Sofia Santilli

ABOUT ME

I have recently achieved a M.Sc. in "Artificial Intelligence and Robotics" cum Laude at "La Sapienza", University of Rome. I am passionate about everything related to AI, especially about its applications to robotic and medical domains. I am a motivated, curious and proactive person with good organisational and communicative skills.

EDUCATION AND TRAINING

Master degree in "Artificial Intelligence and Robotics"
"La Sapienza", University of Rome [28/09/2020 – 31/01/2023]

Final grade: 110 cum Laude

Thesis: "Formalization and comparative analysis of AI planning models in an industrial robotic scenario"

Bachelor degree in "Ingegneria Informatica e Automatica"
"La Sapienza", University of Rome [21/09/2017 – 09/12/2020]

Final grade: 110 cum Laude

Thesis: "Control law of a formation of mobile robots"

High school Diploma
IISS "Charles Darwin", Scientific high school, Rome [12/09/2012 – 11/07/2017]

Final grade: 100/100

PUBLICATIONS

A formalization of multi-agent planning, with explicit agent representation

[2023] In Proceedings of ACM SAC Conference (SAC'23)

Authors: A. Trapasso, S. Santilli, L. Iocchi, F. Patrizi

Modelling automated industrial experiments as incremental diverse AI planning problems

[2022] In Proceedings of AIRO'22 Workshop

Authors: A. Lomuscio, F. Rrapi, P. Esposito, S. Santilli, A. Trapasso, L. Iocchi, F. Patrizi, F. Zonfrilli

HONOURS AND AWARDS

15th classified out of 120 teams in "The Global AI challenge"

[24/02/2022] Artificial Intelligence Institute of Innopolis University, Russia

Topic of the challenge: Machine learning model for molecular activity prediction

TECHNICAL EXPERIENCE

Formalization and comparative analysis of AI planning models in an industrial robotic scenario

[07/2022 – 01/2023]

This master thesis work originates from the collaboration with the *Procter&Gamble* Company and takes part to the European project *Alplan4EU*. The use-case examined consists in a robotic manipulator performing quality control tests on laundry soluble capsules This work exploits AI planning in order to bring benefits to a production that requires to differentiate tests. Different planning formalisms are used to model the problem and the solution plans obtained are compared with respect to both qualitative and quantitative aspects. Possible inconveniences due to the dynamic environment are managed through the introduction of execution rules. These rules can exploit some human actions formalized in the planning domain. In fact human-aware planning is exploited, discussing how a symbiotic relationship among robots and humans allows to overcome robots' limitations. This work contributed to two articles.

Hanoi - a social robot for people's entertainment

[06/2022 – 07/2022]

This project consisted in programming a Pepper robot, in order to develop a social agent, able to reason and cooperate with a human in order to solve the Towers of Hanoi game. The robot is provided of social abilies: it does not approach humans engaged in something else and submits the user to an initial questionnaire in order to collect some data and advise the most appropriate game level. We also developed the web application in order to let the user play on the tablet provided by Pepper.

Deep Learning for Visual Question Answering

[05/2022 – 07/2022]

In order to deal with the VQA task, it were implemented two trivial baselines (random baseline and prior yes), a more consistent approach exploiting CNN and LSTM and a state-of-the-art generative approach. Training and tests were performed on the COCO and Abstract Scenes dataset.

Conditional GAN for brain MRI denoising in the k-space

[01/2022 – 05/2022]

It is proposed and developed a novel approach for brain MRI denoising in the k-space: a Conditional Generative Adversarial Network (CGAN) . Previously denoising of brain MRI in the k-space was done through simpler DnCNN, used as baseline.

Comparing classic and primitive-based versions of kinodynamic RRT*

[01/2022 – 05/2022]

A classical and a primitive-based version of RRT* are implemented and tested in different CoppeliaSim scenes, in which a unicycle moves. Qualitative and quantitative comparisons between the results obtained are done.

OTHER EXPERIENCES

Youth camp and sailing course at "Marina Militare", Livorno, for deserving students

[04/07/2013 – 14/07/2013]

Youth camp at "Guardia Costiera", Pescara, for deserving students

[05/07/2016 – 12/07/2016]

Partecipation to the "Math Olympics", in teams and in single (from 2nd to 5th year of high school)

[2014 – 2017]

WORK EXPERIENCE

Occasional collaboration

Casa editrice "Valore Scuola", Roma [01/2019 – 12/2022]

Editorial activity and operations related to accounting management.

Volunteering

UISP Roma [11/2022 – 12/2022]

51st edition of the event "Corri per il Verde" (four stages). I took care of the mounting, registration of partecipants and the arrivals management.

DIGITAL SKILLS

Programming languages

C / Python / C++ / Java / HTML5/ CSS/ JS/ JQuery / Assembly x86 / SQL / Prolog / PDDL / PHP / MATLAB

Development tools

ROS Gazebo / Coppeliasim - Vrep / GoogleColab / Android Studio / Eclipse / JupiterNotebook / Anaconda / git

AI frameworks, libraries and other tools

Tensorflow / NLTK / ML python libraries pytorch numpy pandas sklearn scipy / Keras / OpenCV

LANGUAGE SKILLS

Mother tongue(s): **Italian**

Other language(s):

English

LISTENING C1 **READING** C2 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

French

LISTENING A1 **READING** A1 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

HOBBIES AND INTERESTS

Karate at a competitive level, swimming, hiking, travelling, graphic design, brain teasers, embroidery

Il presente curriculum vitae è ai fini della pubblicazione. Autorizzo il trattamento dei miei dati personali ai sensi del Dlgs 196 del 30 giugno 2003 e dell'art. 13 GDPR.

Roma, 23/02/2023