

# Antonio Pio Ricciardi



## Education

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PhD student in Computer Science at La Sapienza, University of Rome. My work covers a broad variety of fields in Artificial Intelligence, with a particular focus on Reinforcement Learning and Interpretability.

### PhD Student

LA SAPIENZA UNIVERSITY OF ROME - DEPARTMENT OF COMPUTER SCIENCE

Rome, IT

Since November 2020

### Master Degree in Computer Science - Taught in English (110L/110 and GPA: 3.92)

LA SAPIENZA UNIVERSITY OF ROME

Rome, IT

2017 - 2020

### Bachelor in Computer Science (98/110)

LA SAPIENZA

Rome, IT

2013 - 2017

### High School Diploma in Electrical Engineering

ITIS DI MAGGIO


San Giovanni Rotondo, IT

2007 - 2012

## Skills

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### Competences

Machine Learning, Artificial Intelligence, Deep Learning, Reinforcement Learning, Algorithms, Distributed Systems, Parallel Computing, PyTorch, Tensorflow, Blender, Maya, Unix, SQL, Git, 

### Programming Languages

Python, Java, MATLAB, C#, C++, C

### Spoken Languages

Italian (Native), English (C1 - According to TOEFL iBT)

## Experiences

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### Data Scientist - Part time

DSTECH

Rome

November 2020 - February 2021

Data Scientist and researcher for Horizon Europe projects: AI empowered and explainable personalized medicine system for cancer treatment; Reinforcement Learning agents to help the transition to Nearly-Zero or Net-Plus energy buildings.

### Python Developer - Stage

SAYDIGITAL

Rome

June 2020

Python developer for the Odoo platform.

### Conference - The Ethics and Law of AI

CHAMBER OF DEPUTIES - ROME

Rome

21-22 November 2019

Chosen to be part of a delegation of 20 best students to represent La Sapienza at the Conference, held by Fondazione Leonardo to discuss about technical, ethical and legal matters concerning Artificial Intelligence.

### Volunteer

ACM WOMENENCOURAGE

Rome

16-18 September 2019

Volunteered to help organize the various activities held during the three-days conference.

## Projects

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### Reinforcement Learning Sketcher

RESEARCH

2021

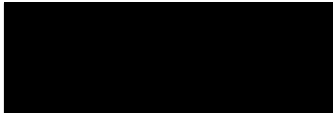
The goal is, given an input image, to teach an agent to draw that image. Hopefully, thanks to spectral geometry, this research might extend to 3D modeling.

### Modern Reinforcement Learning: Deep Q Learning and Actor-Critic methods

PERSONAL PROJECT - LINKED TO UDEMY COURSE, BY DR. PHIL TABOR

2021

Implemented Deep Reinforcement Learning Research papers into agents that beat classic Atari games, or agents that can perform model-based control in a physics engine (MuJoCo and PyBullet), such as robit arms, 2D and 3D walker, ant, cheetah.



## Uncompressed inference for interpretable text classification

MASTER DEGREE THESIS

2020

This work has two contributions: the introduction of a novel method, called uncompressed inference, which allows to perform interpretable predictions for neural networks; the use of uncompressed inference and sparse word embeddings to perform text classification and rank words by their importance.

## Self Driving Car in Unity

COMPUTER VISION COURSE

2019

This project is realized with Unity, a 3D development platform. The objective was to teach a car to stay on a track, by steering in a 3D simulated world. Cameras are placed on top of the car and captured images are analysed by a Convolutional Neural Network. A classifier predicts the steering angle accordingly to the features coming from the CNN. This is a Supervised Task.

## Reinforcement Learning Car in Unity (2 projects)

MACHINE LEARNING COURSE

2019

This project is realized with Unity, a 3D development platform. In a walls-bounded track and by only using distance sensors, a car has to keep going without crashing into walls. Reinforcement Learning is used.

NATURAL LANGUAGE PROCESSING - HOMEWORKS

2018

The completion of three homeworks - *generating Word Embeddings*, *Word Sense Disambiguation* and *Semantic Role Labeling* - was required to pass this course.

## Natural Input Interfaces for a Multimodal Desktop Environment

MULTIMODAL INTERACTION COURSE

2019

Provide an alternative way to control a desktop environment, by using a camera-based gaze-controlled pointer and voice commands for other interactions (such as *Open*, *Close*, navigating through pages ...), thanks to the Speech-to-Text Google API.

## Question Answering Chatbot

BACHELOR DEGREE THESIS

2017

A chatbot that used a shallow level of Machine Learning to classify questions types and then Stanford NLP Parser and BabelNet to answer them. By using Naive Bayes, the bot was trained to recognize all kinds of WH-Questions.

## Pensiero Profondo

PROGRAMMING METHODOLOGIES COURSE

2014

Question Answering system for movies, built on top of the Freebase knowledge base. The project was realized by performing queries over the database and then linking them to question types to provide per-type answers. This project was a part of a programming course, during my Bachelor.

## Relevant Courses

A list of some of the most interesting courses I attended to:

FUNDAMENTALS OF REINFORCEMENT LEARNING - COURSERA, BY UNIVERSITY OF ALBERTA

2021

Key concepts of Reinforcement Learning, underlying classic and modern algorithms in RL: Markov Decision processes, exploration/exploitation tradeoff, value and action-value functions, designing dynamic programming algorithms

MODERN REINFORCEMENT LEARNING: ACTOR-CRITIC METHODS - UDEMY, BY DR. PHIL TABOR

2021

Study and implementation of the latest Deep Reinforcement Learning algorithms and breakthrough Research papers: MonteCarlo, Deep Policy Gradient, Actor-Critic methods and their variants to teach agents to perform model-based control in a physics engine (MuJoCo).

MODERN REINFORCEMENT LEARNING: DEEP Q LEARNING METHODS - UDEMY, BY DR. PHIL TABOR

2020

Study and implementation of Deep Reinforcement Learning algorithms and breakthrough Research papers: DQN, DDQN, DuelingDDQN.

COMPUTER GRAPHICS

2020

Topics of 3D shape representation, analysis, processing, matching, and modeling, with emphasis on discrete geometry processing algorithms with applications in computer vision and graphics. The course reviewed the key mathematical concepts and proceeded up to the most recent advances in the area.

MACHINE LEARNING

2019

Introduction to Machine Learning. Analysis, paradigms and applications of various ML algorithms (Decision Trees, Neural Networks, Deep Learning, SVMs, Naive Bayes, Ensemble and Reinforcement Learning).

ADVANCED ALGORITHMS

2019

Algorithms and data structures that are used for the efficient resolution of important applied problems, with particular interest on the design of algorithms that operate on parallel architectures.

COMPUTER VISION

2019

Techniques and applications of methods and algorithms for image analysis, such as pattern-recognition, segmentation. Artificial Intelligence techniques were treated and used, too.