

# Pietro Sillano

MSc. PHYSICS STUDENT

Turin, Italy

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## Interests of Research

My main interests of research are:

- Physics of Living Systems
- Link between Statistical Mechanics and Deep Learning
- Computational Neuroscience

## Education

### Master's Degree in Physics of Complex Systems

UNIVERSITY OF TURIN

*Turin, Italy*

*Oct. 2020 - Present*

### B.S. in Physics Engineering

POLYTECHNIC OF TURIN

*Turin, Italy*

*Oct. 2017 - Oct. 2020*

Bachelor Thesis: "Modelling Competing Endogenous RNA Networks" with A. Pagnani

## Skills

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|----------------------------|--|
| <b>Proficiency</b>         | <ul style="list-style-type: none"><li>• <b>Python:</b> Numpy, Scipy, Pandas, Matplotlib, Scikit-Learn</li><li>• Machine Learning and Deep Learning: Scikit-learn, Keras, PyTorch</li></ul> |
| <b>Basic proficiency</b>   | <ul style="list-style-type: none"><li>• C, C++, Foundations of OOP (ROOT Framework)</li></ul>  |
| <b>Operative knowledge</b> | <ul style="list-style-type: none"><li>• Linux, git, Latex</li></ul>  |
| <b>Languages</b>           | <ul style="list-style-type: none"><li>• Italian: Native</li><li>• English: IELTS Academic Test - 6.5 (2018)</li></ul>  |

## Experience

### Visiting Research Student

NICOLAUS COPERNICUS UNIVERSITY

*Torun, Poland*

*July 2021*

Collaborated with History Department to design a modern approach of analyzing Latin text exploiting **Natural Language Processing** methods (based on **BERT**).

### Member

MACHINE LEARNING JOURNAL CLUB

*Turin, Italy*

*2021 - Present*

- It's a **student organization** which aims to explore the most recent applications of AI, along with the creation of open source content
- I work in designing and developing several **Machine Learning** projects involving Medical AI and Brain Computer Interfaces
- Co-supervising a project on **Neurofeedback** based on OpenBCI devices. In charge of the EEG data acquisition and data analysis.

### Student Tutor

UNIVERSITY OF TURIN

*Turin, Italy*

*2020 - Present*

- Physics Laboratory I - 50 hours
- Introduction to Scientific Programming - 50 hours

### Member

TEAM POLICUMBENT (POLYTECHNIC OF TURIN)

*Turin, Italy*

*2019*

It's a student team which aims to design and build from scratch a recumbent-like bike, join an international competition (**WHPSC** race) trying to break the human-powered land speed record. I worked on developing and testing a Python library for the bike **telemetry system**.

### HACKATHONS AND COMPETITIONS

#### BR41N.IO

INTERNATIONAL BRAIN COMPUTER INTERFACE HACKATHON

Tested and validated different ML models with stroke patients EEG data.

*Apr 2021*

*Online*

### PERSONAL PROJECTS

#### COUGHvid

COVID-19 COUGH CLASSIFICATION BASED ON AUDIO SAMPLES

- Learned how to extract meaningful and representative features from audio data through STFT transform
- Deepened my knowledge about transfer learning and pretrained models for image recognition like: **ResNet**, **Inception v3** and **EfficientNet**

*Summer 2021*

#### Sindy Pendulum

EXTRACTING SIMPLE PHYSICS DYNAMICAL MODELS FROM HIGH DIMENSIONAL DATA

- Identification of parsimonious dynamical models from high dimensional data with Autoencoder neural network
- Improved my knowledge about building a neural network architecture from scratch and PyTorch

*Fall 2021*

### TALKS

#### Brain Computer Interface: a new future for disabilities

ORGANIZED BY INTESA SANPAOLO INNOVATION CENTER

Presenting the new possibilities for disabled people thanks to the developments in the Brain Computer Interface field.

*Oct 2021*

## Relevant Coursework

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- Statistical Mechanics
- Stochastic Processes
- Nonequilibrium statistical mechanics
- Complex Systems for Biology
- Complex Systems for Neuroscience
- Numerical Algorithm for Physics
- Neural Network
- Data Mining and Statistical Learning