

Nicolo' Pedrani

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Research Interests

During my Master's years I developed a strong interest towards Statistical Physics, Complex Systems, Computational Physics, Networks dynamics, Monte Carlo Algorithms and Molecular Dynamics Simulation. I strive to work in a context where theory about physical and real-life complex systems can be tested by, and give insights into, simulation methods. This led me to work on a Master thesis in understanding, using computational methods, the emergent behaviour of a system composed by single strands DNA in a competitive environment. From a PhD course I expect to learn more about Complex Systems Theory, Monte Carlo Algorithms, Network Theory and exploit the mathematical machinery typical of computational methods.

Keywords Statistical Physics, Complex Systems, Monte Carlo Algorithms, Networks Dynamics, Computational Physics, Biophysics simulation

General Information

birthplace Segrate (MI), Italy birthdate 24/04/1996
nationality Italian gender male

Education

2019–2021 **M.Sc. in Physics**, *Università degli studi di Milano*, Milan, Italy, *Master Diploma*.
Expected to end in July 2021

2015–2018 **B.Sc. in Physics**, *Università degli studi di Milano*, Milan, Italy, *Bachelor Diploma*.
110/110 cum laude

Master thesis

title *Emergent ecological patterns through simulation of interacting DNA single strands*
supervisors Professor Samir Simon Suweis (Università degli studi di Padova), Professor Davide Emilio Galli (Università degli studi di Milano)
co-supervisors Doctor Francesco Mambretti

Bachelor thesis

title *Modeling and Simulation of electrical transport in nanostructures*
supervisors Professor Davide Emilio Galli and Paolo Milani
co-supervisors Doctor Francesco Mambretti

Other relevant experiences

Students' representative

During the years of my M.Sc. I have been elected by my fellow students to represent them for two-year terms. Here I listed two of the most relevant roles I covered

2018–2020 **Member of the Physics Department Council.**

2018–2020 **Member of Library Scientific Committee at Physics Department.**

Working experience

2018–2020 **Tour Guide**, *FLABS, Fondazione Lombardia per l'Ambiente*, Milan.

It offers the opportunity to visit its own physics laboratories. My role was to guide students through these labs, explaining physics experiments.

from 2018 **Tutor**, *Camplus*, Milan.

Camplus is a University Campus which offers students private lessons to prepare their exams.

from 2021 **Teacher**, *Sacro Cuore High School*, Gallarate.

Currently I'm working in a High School teaching Informatics.

Languages

Italian Mother tongue

English B2

Spanish Pre-Intermediate

Computer skills

Over the past years I've worked with `c++` (Advanced level), LaTeX, Python, Mathematica and Octave. I've also worked with Cuda parallelizing a simple Molecular Dynamic code (written on my own) and MPI parallelizing a Genetic Algorithm.

During my Bachelor's thesis I used the HPC resources of CINECA using OpenMP.

During my Master's Thesis I'm working with other two super computer clusters: INDACO and CloudVeneto.

Other experiences

2020 **Summer School**, *HPC Cineca*.

High Performance Molecular Dynamics Course

2020 **Online Certificate**, *Coursera*.

Machine learning coding in Octave/Matlab. I've also wrote down a simple machine learning code that recognize digits number in `c++`

Publications

article Mambretti F., Mirigliano M., Tentori E., Pedrani N., Milani P. and D. E. Galli, "Stochastic simulation of nanostructured devices for neuromorphic applications", in preparation (2021)