






# Loredana Sandu

 [loredanasandu.github.io](https://loredanasandu.github.io) |  [loredana-sandu](https://www.linkedin.com/in/loredana-sandu) |  [loredanasandu](https://github.com/loredanasandu)  
 [loredana.sandu@estudiants.urv.cat](mailto:loredana.sandu@estudiants.urv.cat) |  Barcelona

## EDUCATION

### Master's Degree in Computational and Mathematical Engineering

University of Rovira i Virgili

September 2023 – ongoing

Barcelona, Spain

- Specializing in mathematical modeling and simulation, artificial intelligence and operations research.
- Expected graduation date: June 2024.

### Bachelor's Degree in Mathematics

Autonomous University of Barcelona

September 2019 – June 2023

Barcelona, Spain

- Bachelor's Thesis: "Fuzzy Logic in Artificial Intelligence: a study of fuzzy set theory and its applications to Explainable AI" (grade: 10.00 / 10.00, with Honours). Advised by Prof. Pilar Dellunde and Prof. Wolfgang Pitsch.
- Erasmus+ Exchange Programme at the University of Vienna (September 2022 – February 2023).
- GPA: 7.64 / 10.00

### Baccalaureate (with Honours)

Gallecs High School

September 2017 – May 2019

Barcelona, Spain

- Research project: "Study on the evolution of the labour market in Spain during the decade following the 2008 economic recession" (grade: 10.00 / 10.00).
- GPA: 10.00 / 10.00
- Achieved a grade of 13.76 / 14.00 in the University entrance exams (PAU).

## WORK EXPERIENCE

### Research Intern

Centre for Research in Agricultural Genomics (CRAG)

March 2023 – June 2023

Barcelona, Spain

- Intern in the *Rosaceae genetics and genomics* group, part of the Research program on Plant and Animal Genomics.
- Worked on the development of deep learning models with applications in plant genomics.
- Developed models based on Convolutional Neural Networks (CNNs), Variational Autoencoders (VAEs), Vision Transformers (ViTs) and Generative Adversarial Networks (GANs) to extract patterns of SNPs and predict quantitative traits.

### Private Programming Tutor

Self-employed

July 2020 – July 2022

Remote

- Taught Python, C and SQL remotely to teenage and adult students. Emphasized practical use cases in the areas of data science, machine learning, and APIs.
- The classes were focused on libraries like Pandas, Matplotlib, scikit-learn and Pytorch, and tools like Jupyter Notebook, Git, and Json. I also included the use of frameworks like Django, and databases like MySQL.
- Most students were located in the United Kingdom, Germany and Spain. Occasionally, I also worked with students from the United States and Ecuador.

## SELECTED PROJECTS AND REPORTS

### Extending the SIR model through Branching Processes

Mathematical Modeling, Stochastic Processes, Python, Academic writing

February 2023

 [Report](#) |  [Code](#)

- Modeled the spread of an infection through a population with two types of individuals: those with a high number of social contacts and those with a low number of social contacts. Performed mathematical analysis, and numerical and stochastic simulations using Python.
- Project conducted as part of the course *Modeling in evolutionary ecology and epidemiology* at the University of Vienna, co-authored with Aäron Roex.
- Advised by Dr. Himani Sachdeva and Dr. Jitka Polechová.

### Simulation of the flocking behavior of birds

Mathematical Modeling, Python, GnuPlot, Git, Academic Writing

June 2021


 [Report \(in Catalan\)](#) |  [Code](#)

- Modeled the flocking behavior of birds, and the effect of the presence of elements such as food sources and predators on the flock. Developed a program using Python and GnuPlot to run the simulation.
- Project conducted as part of the course *Workshop in Mathematical Modelling* at the Autonomous University of Barcelona, co-authored with Anna Danot, Núria Fernández and Jan Mousavi.
- Advised by Prof. Julià Cufí and Prof. Xavier Mora.

### Classification of Convex Cones

C, Abstract Algebra

May 2020

 [Source code](#)

- Program that classifies the convex cone generated by input vectors in the 3-dimensional real vector space.
- Project developed as part of the course *Computational Tools for Mathematics* at the Autonomous University of Barcelona.
- Advised by Prof. Joaquim Roé.

## COURSES AND CERTIFICATES

### SQL for Data Science

University of California, Davis

July 2021

### Python 3 Programming Specialization

University of Michigan

July 2021

### Certificate of Proficiency in English (CPE)

University of Cambridge

July 2020

### C Programming Course

Mollet's Informatics Center

May 2016

## SKILLS

<b>Industry knowledge</b>	Programming and Computing   Mathematical Modeling and Optimization   Artificial Intelligence   Deep Learning   Statistics   Simulation   Operations Research
<b>Programming Languages</b>	Python   C   R   AMPL   MATLAB   SQL   C++   Julia   JavaScript   HTML   CSS
<b>Libraries and Frameworks</b>	PyTorch   scikit-learn   Pandas   Numpy   Matplotlib   Seaborn   Django   OpenCV   Pillow   Tesseract
<b>Tools and Platforms</b>	Git   Jupyter Notebook   Anaconda   $\text{\LaTeX}$   SageMath   Heroku   Digital Ocean
<b>Soft Skills and Others</b>	Resourceful   Innovative   Problem Solving   Fast Learner   Committed   Persistent   Curious   Lively

## LANGUAGES

<b>English</b>	Proficient (Level C2)
<b>Spanish</b>	Native
<b>Catalan</b>	Native
<b>Romanian</b>	Intermediate

## AWARDS AND ACHIEVEMENTS

### Recognition of excellence at the University entrance exams (PAU)

Interuniversity Council of Catalonia (CIC), Generalitat de Catalunya

July 2019

- Distinction awarded to students in Catalonia who, in the June ordinary sitting, have obtained a grade equal to or higher than 9.00/10.00 points as a qualification for the general phase of the University entrance exams (PAU).

## OTHER INTERESTS

Philosophy (esp. mind, logic, ethics, Eastern) | Technology | Literature | Writing | History (esp. ancient, Renaissance, contemporary) | Culture and Travelling | Chess | Calisthenics | Swimming | Classical music and guitar