

Deep learning for biologists

The course, the instructors, the participants

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- 5 days, from 14:00 to 20:00, two/three breaks per day
- mix of:
 - slides → lectures
 - jupyter notebooks → hands-on sessions
 - do-it-ourselves exercises (collaborative)
- introductory course aimed for:
 - biologists with little data analysis experience who wish to understand what all the fuss about DL is
 - more experienced biologists who wish to apply DL to their own research projects
 - a combination of the above









- the two instructors will interchange during the 5 days in leading the lectures and practicals: the other will assist you if you have questions or technical problems (slack channels, etc.)
- questions are welcome at all times: don't be shy and ask if something is not clear!
- the **do-it-together collaborative exercises** will be a chance to practice what we learnt and discuss it together
- the Kahoot quiz will test our knowledge
- at the end of the course, usually doubts remain: if you are interested, next week the instructors will organise a 1.5 hrs Zoom session to answer your questions and discuss your DL projects









- What is Deep Learning?
- The black box: a neural network for image recognition
- The building blocks of deep learning
- From logistic regression to neural networks: the not-so-black box
- Cross-validation and performance measures
- More building blocks: advanced stuff
- Convolutional neural networks
- Deep learning models for biological classification problems
- Transfer learning
- Deep learning for regression problems
- Recurrent Neural Networks
- Image segmentation









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detailed timetable <u>here</u>









- This is the third edition of the course: few things still to fine tuned, continuously evolving topic & material
- Your feedback will be particularly important: during the course, during the wrap-up discussion on Friday, or when we meet again next week for an aftermath discussion







Filippo in a slide

- Roma (born)
- Perugia (MSc degree)
- Cork, ICBF (Web-design & Database)
- Cremona, ANAFI (Quantitative Genetics)
- Guelph, CGIL (Visiting Scientist)
- Wageningen, WUR (PhD)
- Göttingen University (post-doctoral researcher)
- Lodi, PTP (P.I., 'omics in animals, plants, humans)
- Caldes de Montbui, IRTA (visiting, Bayesian stats)
- Milan CNR (tenured researcher)
- Cardiff University (biostatistician)
- Bruxelles ERC (seconded national expert)
- Milan CNR (senior researcher)





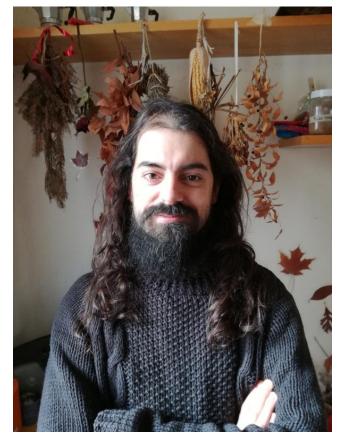




Nelson in a slide

- Tortona (born)
- Pavia (MSc computer engineering, PhD)
- Fairfax, GMU (informatics security)
- Lodi, PTP (database, biostatistician)
- Zagreb, Centre of Excellence for Biodiversity and **Molecular Plant Breeding** (biostatistician)
- Lodi, CREA (tenured researcher)











Us on the internet



- https://bioinformateachers.wordpress.com/
- https://github.com/ne1s0n/bioinformateachers







The participants



So, what about you?





