

Deep learning for biologists

The course, the instructors,
the participants

Filippo Biscarini
Senior Scientist
CNR, Milan (Italy)

Nelson Nazzicari
Senior Scientist
CREA, Lodi (Italy)



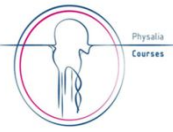
Welcome to Deep Learning for Biologists!



- 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



Welcome to Deep Learning for Biologists!



- 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 **final 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



Welcome to Deep Learning for Biologists!



- 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



Welcome to Deep Learning for Biologists!



- 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
- Image segmentation
- Recurrent Neural Networks

detailed timetable [here](#)



Welcome to Deep Learning for Biologists!



- This is the **fourth edition** of the course: few things still to fine tune, continuously evolving topic & material
- Your feedback will be particularly important to keep the course up and running: 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 (*senior researcher*)



Us on the internet

- <https://bioinformateachers.github.io/>
- <https://github.com/ne1s0n/bioinformateachers>



The participants

So, what about you?

