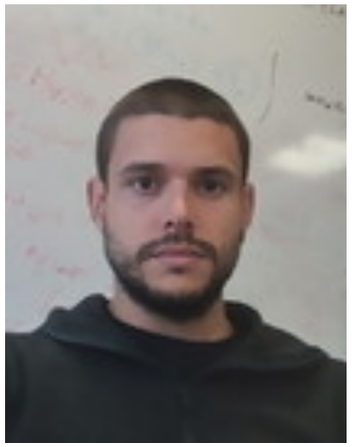
Course on Deep Learning for Ocean and Atmosphere Sciences

June 2023

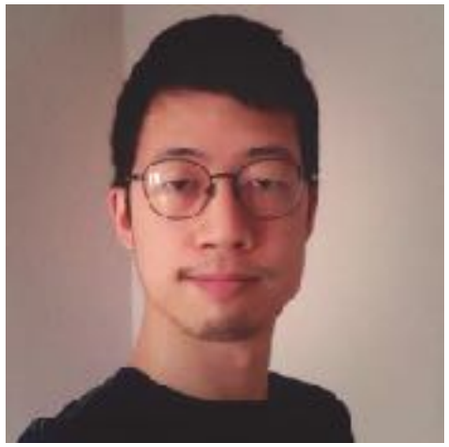
Brest team (IMT Atlantique/Lab-STICC, INRIA team ODYSSEY)

R. Fablet

L. Drumetz



C. Granero Belinchon



D. Zhu

Grenoble team (CNRS/UGA, IGE)

E. Cosme

B. Deremble

Objectives

Key objective: ability to deploy a deep learning approach for ocean-atmosphere topics

Content:

- Introduction of the main Deep learning concepts
- Introduction to learning methodologies
- Introduction to PyTorch “ecosystem”
- Training through practice (labsession and project session)

Overview of the course

	Morning Session 9.30am-12.30pm	Afternoon Session 2.00pm-5.00pm
Day 1	Introduction to Deep Learning and Pytroch (E. Cosme)	Project session #1
Day 2	Multi-Layer Perceptron and Convolutional Neural Networks (E. Cosme)	Introduction to Pytorch Lightning Project session #2
Day 3	Auto-encoders and generative models (R. Fablet)	Introduction to Tensorboard Project session #3
Day 4	Recurrent Neural Networks and Physics-Informed Neural Networks (R. Fablet)	Project session #4
Day 5	Deep Learning and Inverse Problems (R. Fablet)	Project session #5

Resources

- **Book: Deep Learning**

Goodfellow, Bengio, Courville, MIT Press

Online version http://www.deeplearningbook.org/

- **Online course by Andrew Ng (Stanford/Baidu)**

  Youtube: [link]

  Online course on Coursera: [link]

- **Review paper: Deep learning in neural networks by**

  J. Schmidhube pdf: [link]

- **Github repo: https://github.com/CIA-Oceanix/DLOA2023**