

Earth Data Science

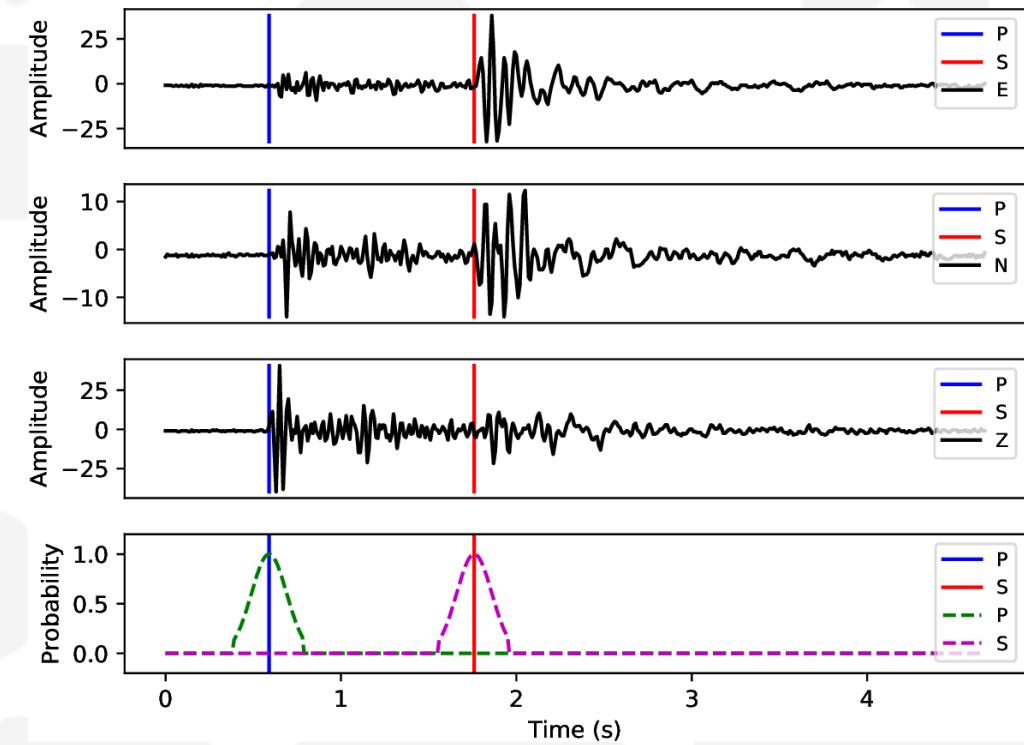
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Goals of this class

- Overcome limitations of physical models
- Extract insights directly from data
- Learn essential data science techniques.

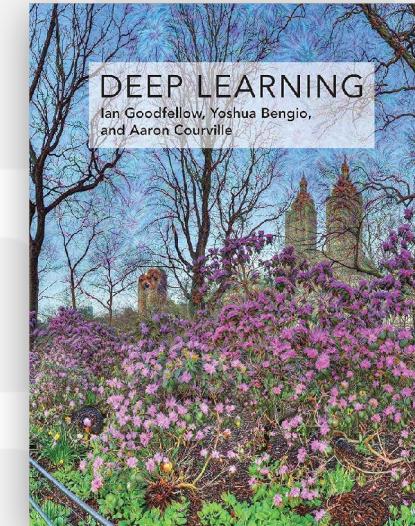
Example: automatic seismic phase picking with deep learning



Introduction to data science, machine learning and deep learning

Lectures (8 hours)

1. Data inspection
2. Problem statement
3. Supervised learning
4. Unsupervised learning
5. Deep learning



Cover of the book "Deep Learning" by Goodfellow et al. (2016)

Practical sessions from data inspection to deep learning

Labs (20 hours)

1. Sensor calibration with supervised learning
2. Monte Carlo hypocenter estimation
3. Lidar point cloud classification
4. Volcano detection on Venus with deep learning



Sampling of river water for suspended load measurement

Exam: improve one of the notebooks as far as possible

Final hackathon (4 hours)

- Groups of 2 or 3 students
- Limited time to optimize the solution
- Minimize the classification error



Tools seen in the class



git



BASH



jupyter



Before joining the class, ensure you have the adequate background

- Did you have a sufficient level to follow this course?
- 20% No
- Tomorrow, 4:30pm, test your knowledge with a quiz (room P04)

