Project types
1 – deep learning

- Two options:
  - We choose a relevant problem and provide the necessary data (examples on Moodle)
  - You choose a different problem
    - You choose your own data source* (e.g., Kaggle)
    - Data preprocessing: **NOT** taken into account for grading

- You design a processing pipeline in PyTorch.

- We expect that you test several approaches and are critical about what you are doing. Discuss in terms of accuracy, training time, etc.

  * Topic needs to be confirmed with the TAs

EPFL

Project types
2 – Build Your Own Pipeline* (BYOP)

- You choose a relevant problem requiring image processing

  (e.g., landcover change, temporal monitoring, land planning)

- You find the necessary data, create or find the labels

- You design a processing pipeline* that makes sense with the ML methods seen in the class (or others, to be discussed)

- We expect that you are critical about what you are doing, discuss what works and what not, discuss in terms of scientific (domain) output

  * Including dataset creation

What we expect

- Groups of 3 students
- Deadline: **January 15th**, midnight*.
- Submission on Moodle.

- The project will consist of
  - A .pdf document (**10 pages max – we won't read further**) with:

    - Topic and challenges, short literature review;
    - Methods (typically including a flowchart);
      - BYOP: How data was acquired and processed.
    - Results (a few maps, assessment of metrics);
    - Discussion → being critical about what has been done.

  - Your code in Python (more details later).

 * NB: our advise is to hand in before December 31st, so that you have two full weeks to study for your exams.
   But we leave it up to you.

Schedule

	1st hour	2nd hour	3rd hour	4th hour	Expected progress
4 October	Classification 1 course		Introduction to projects Exercise classification 1		
11 October	Classification 2 course		Exercise classification 2	Discuss project ideas	
8 November*	Semantic segmentation course		CNN model training		
15 November	Sequence modelling + change detection		Semantic segmentation exercises		Topic chosen, groups ready **in a google form**
22 November	Lab presentation + Q&A mid-term		Project		First processing chain
29 November	Mid term			Project	
06 December	Project				First results
13 December	Project				
20 December	Project				Improved results, start writing report

* We provide the deep learning project datasets

IPEO course – Projects, 04 October 2024

G. Lenczner / ECEO

Evaluation criteria

Criterion	Explanation	Pts. on BYOP	Pts. on deep learning topic
Data (BYOP only)	- Choice of relevant data (resolution, bands, ...) - Data preparation (including dataset splits)	2	0
Method	- Relevant choice of methods - Several methods are compared - Decisions are justified	3	5
Reproducibility, code	- Provided code can be run easily - A readme file with instructions in provided	2	2
Evaluation of results	- Several relevant metrics are computer over train / val splits - Computational complexity (e.g. training time, inference time) is assessed	3	3
Report	- Report is clearly written - Graphics are readable and complete (e.g. axis titles) - Results are analysed - Discussion in terms of scientific (domain) output - Limitations are clearly discussed	2	2
	TOTAL	**12**	**12**

Some advice

- Timing is short, so work well, don't go for over complicated topics.

- Discuss with the assistants to ensure you have a doable idea, so that you can start straight away

- Look for teammates on Slack (You can **not** do a project alone)

- Create a Slack channel for your group, so you can reach the assistants easily