Machine learning and RFID-based large wood tracking in rivers

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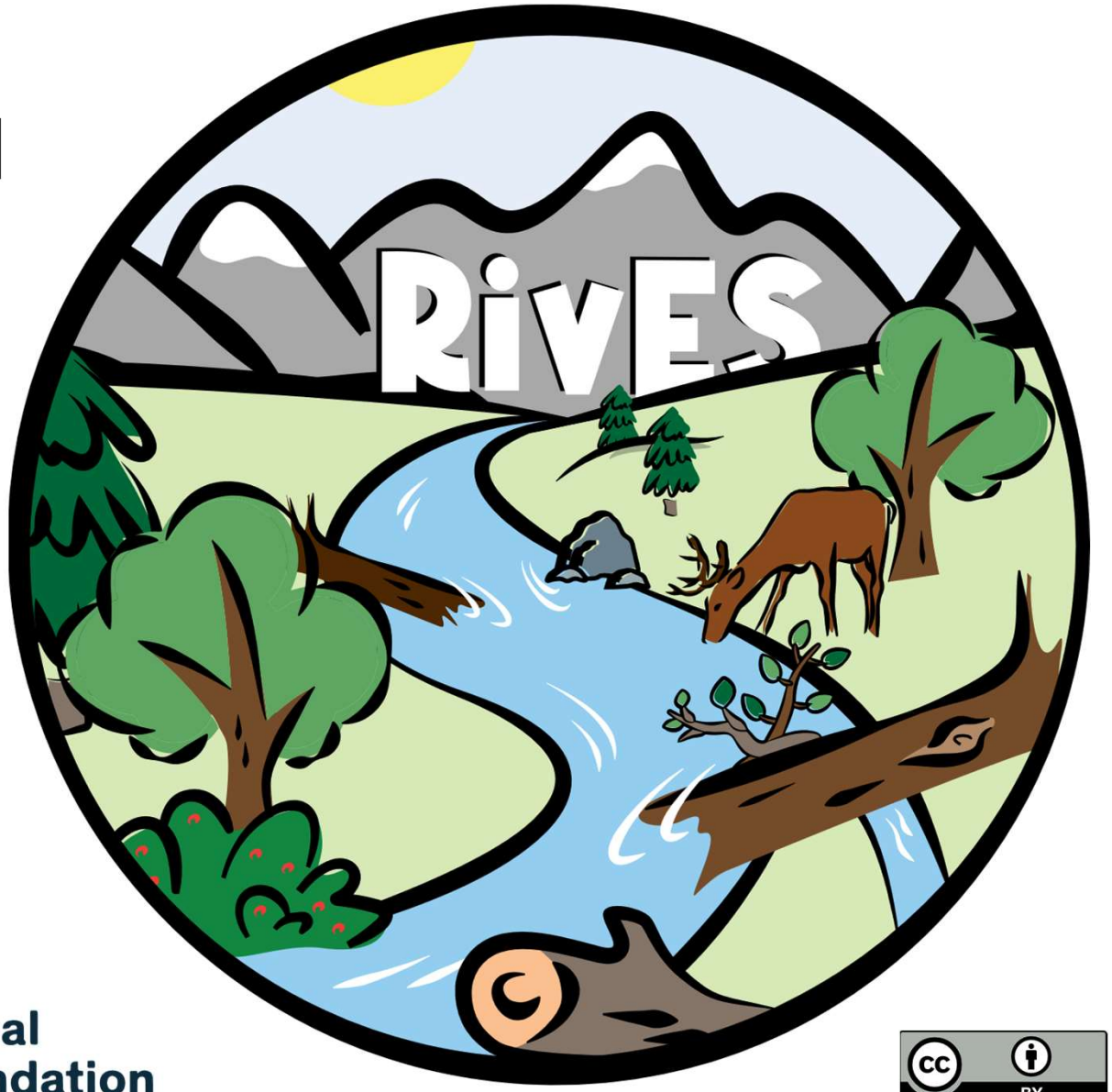

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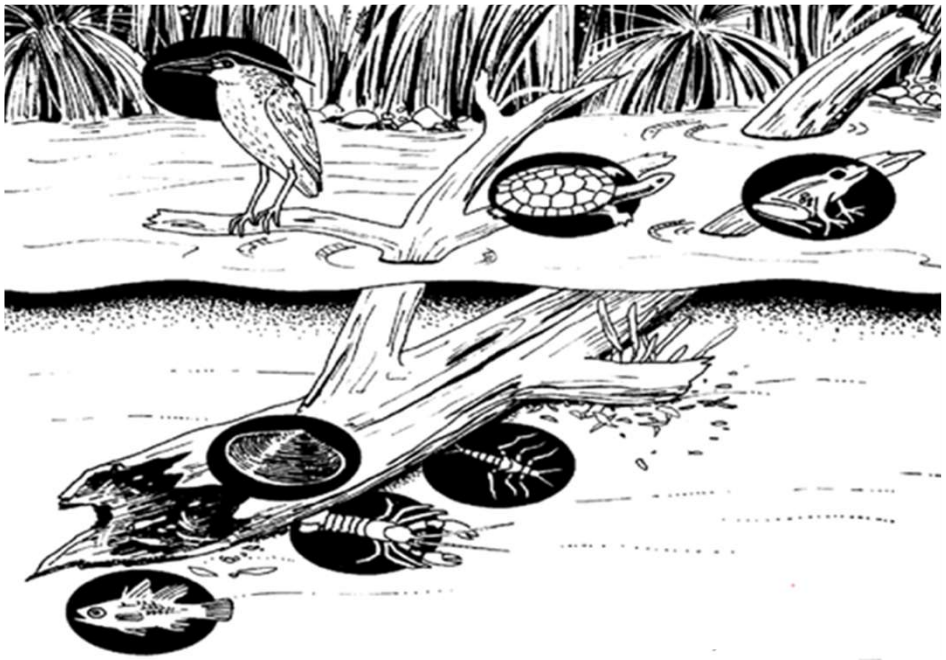
Swiss National Science Foundation

Large Wood: Hazard vs Biodiversity

The Guardian, 2021

vs



Dickinson Art

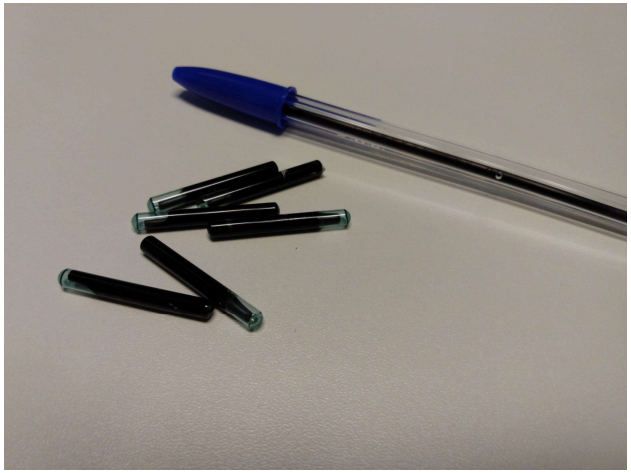
Objectives

- Understand wood transport
  - Tracking
  - Detection
  - Correlate catchment type with wood transport

Quantification of Large Wood

- **Tagging**
- Video monitoring
  - Computer vision
  - Machine learning

Metal tag



RFID tags

Quantification of Large Wood

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- **Video monitoring**
  - **Computer vision**

Quantification of Large Wood

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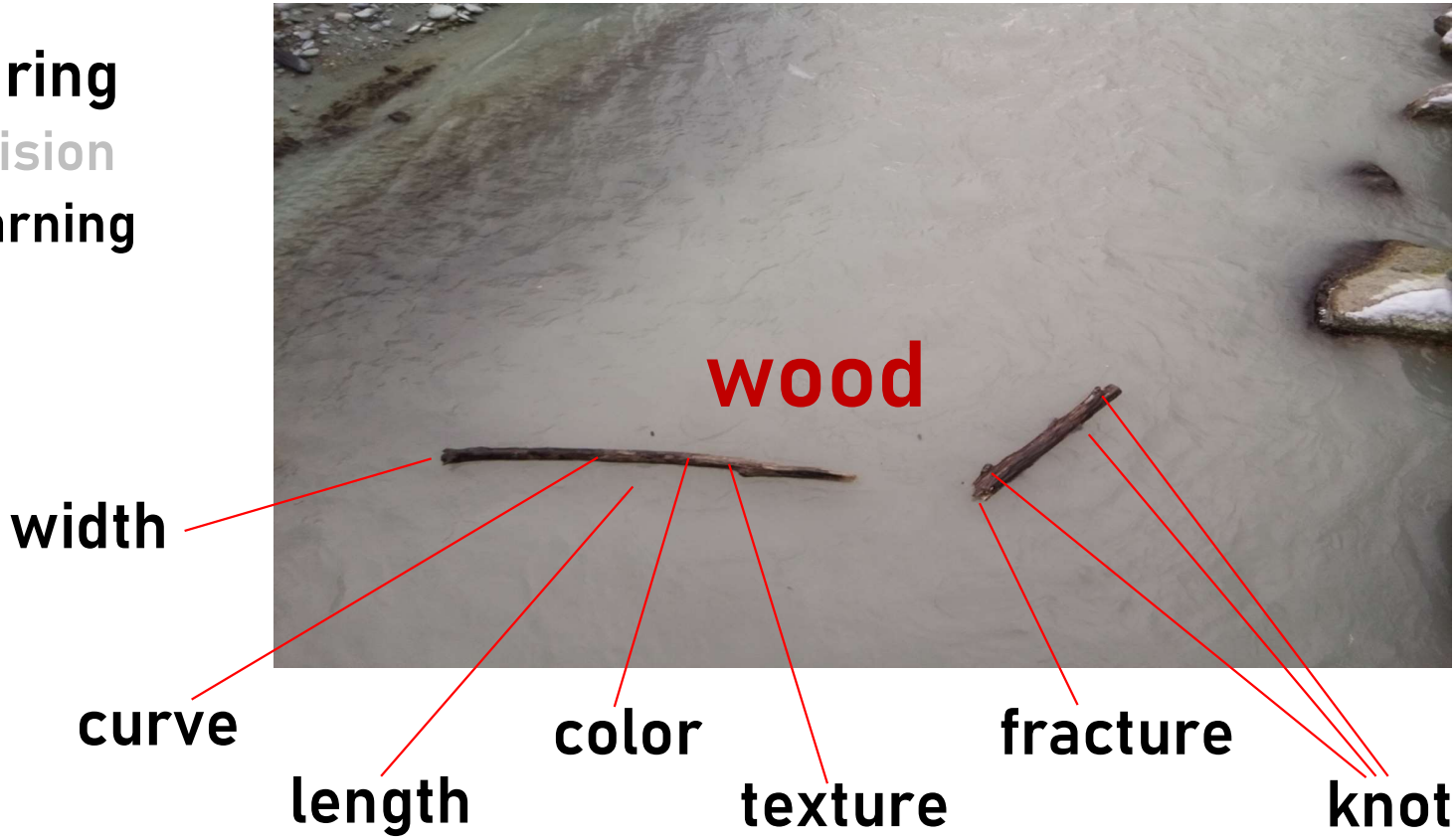
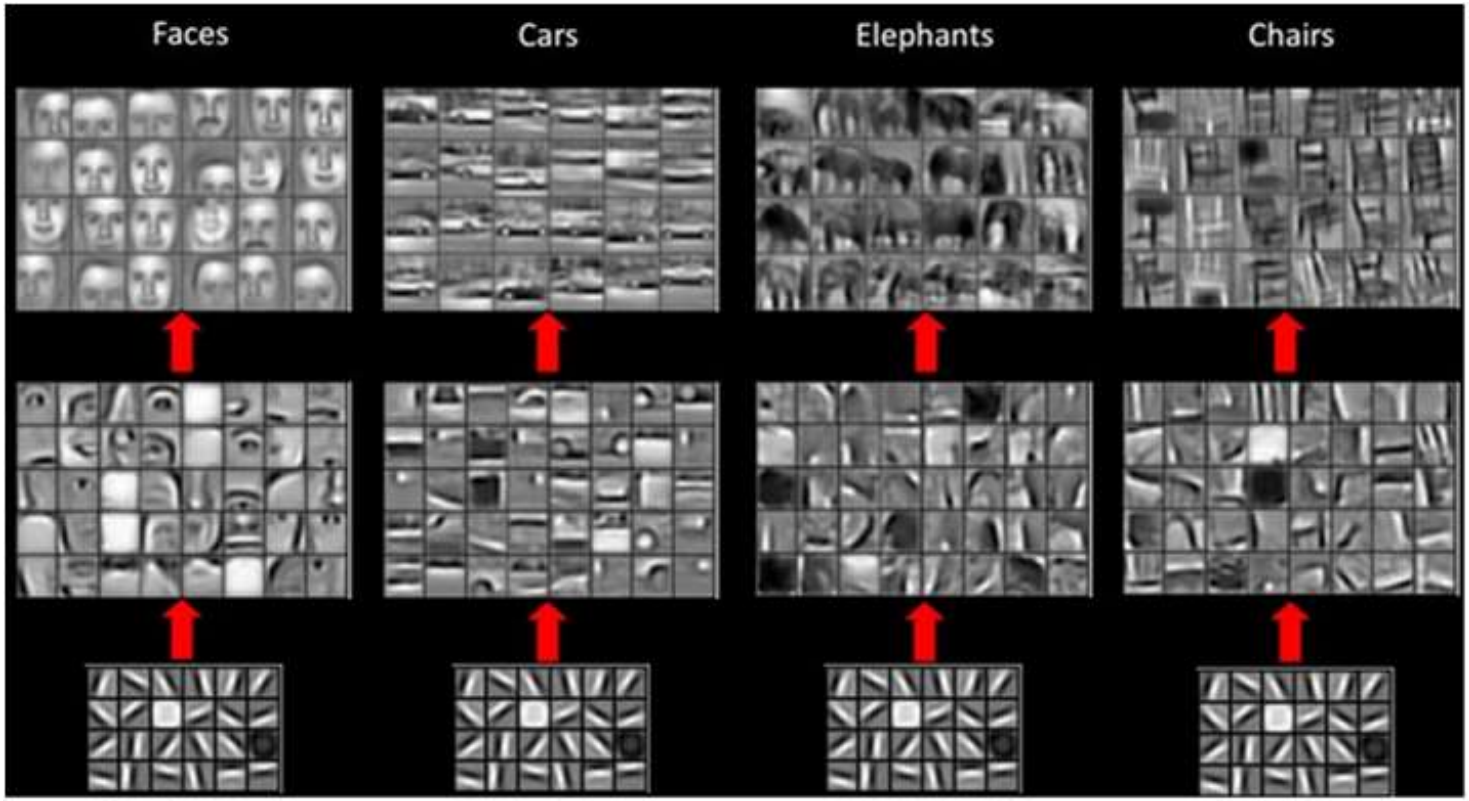
  - **Machine learning**



Quantification of Large Wood

- Tagging
- **Video monitoring**
  - Computer vision
  - **Machine learning**



Filters (Dernoncourt, 2015)

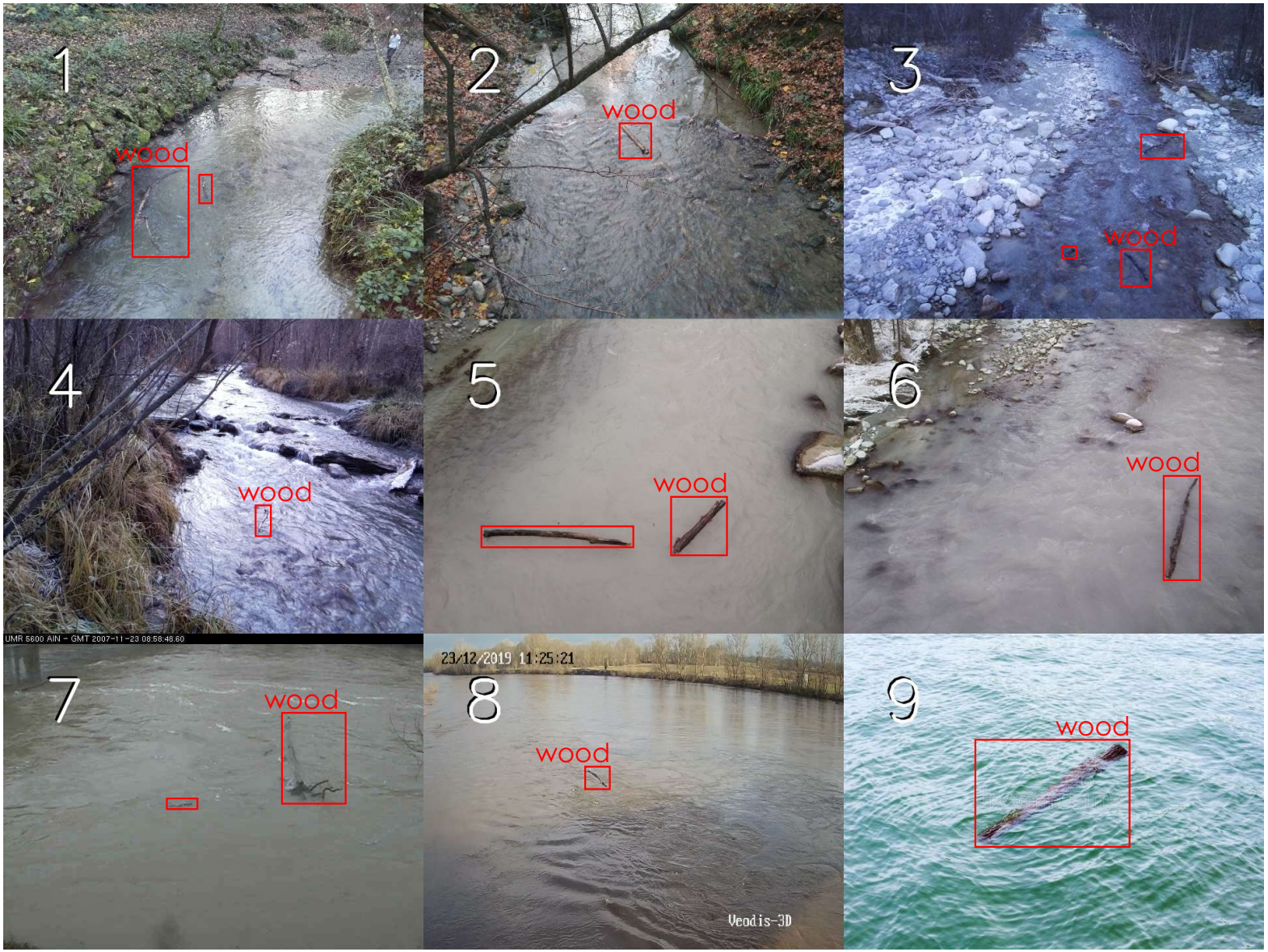
Methods

- 20 datasets
- augmented

#ducttapescience

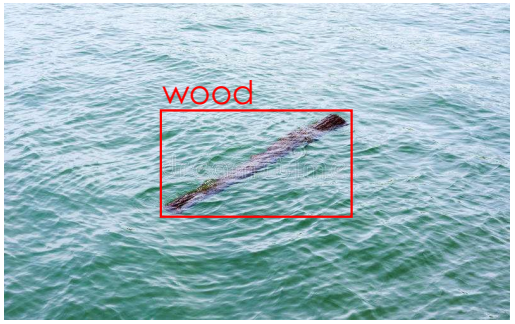
Methods

- **20 datasets**
- augmented

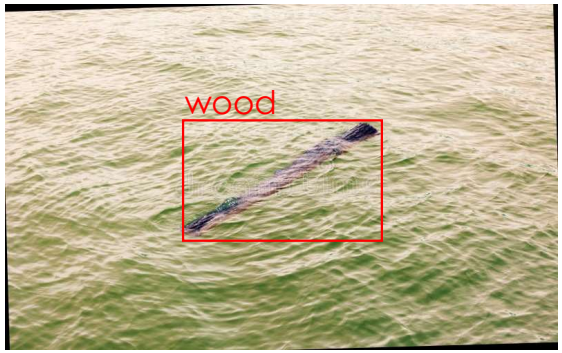


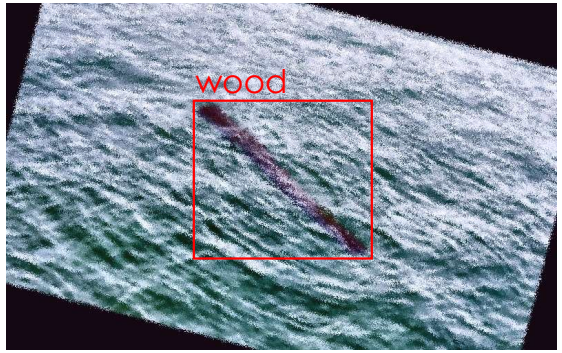
Methods

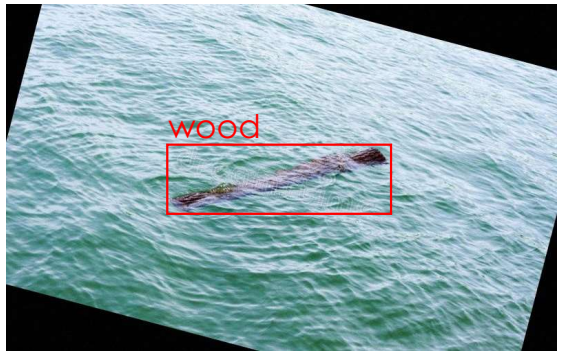
- 20 datasets
- **augmented**

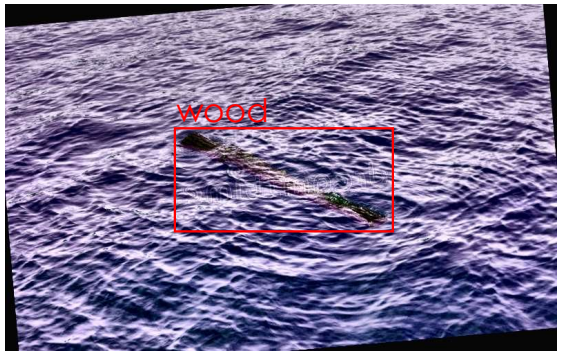


12 types of random augmentation



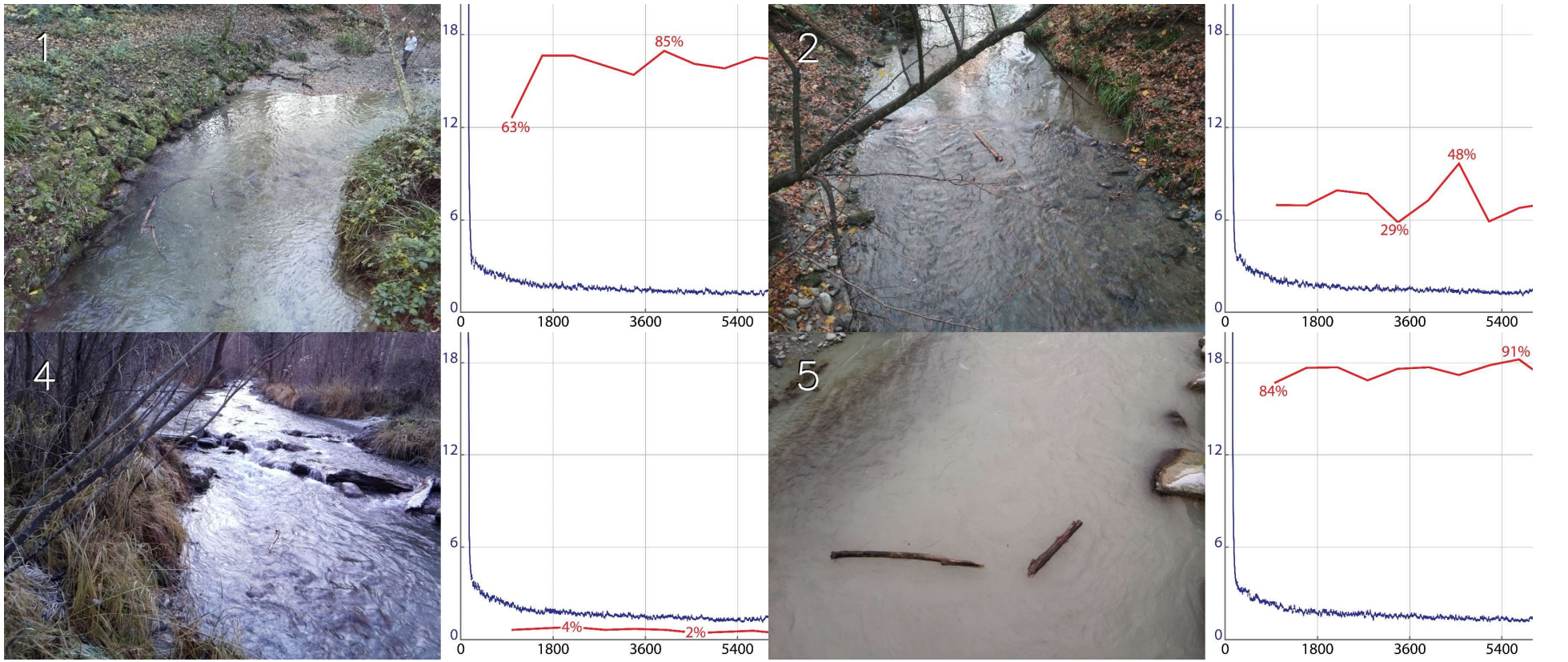






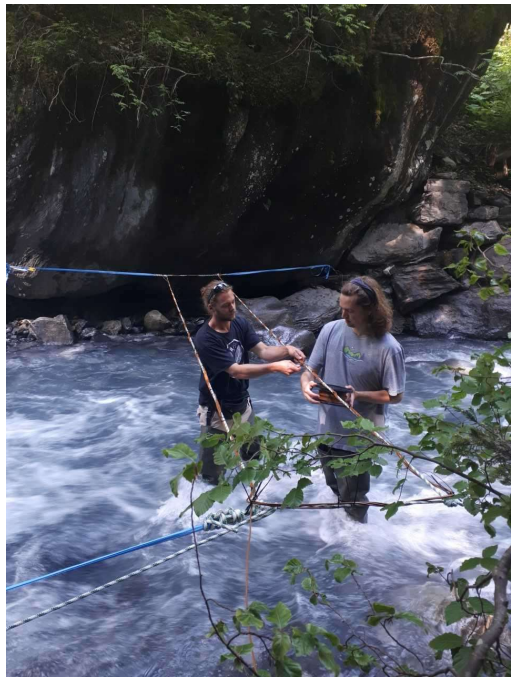
Preliminary Results

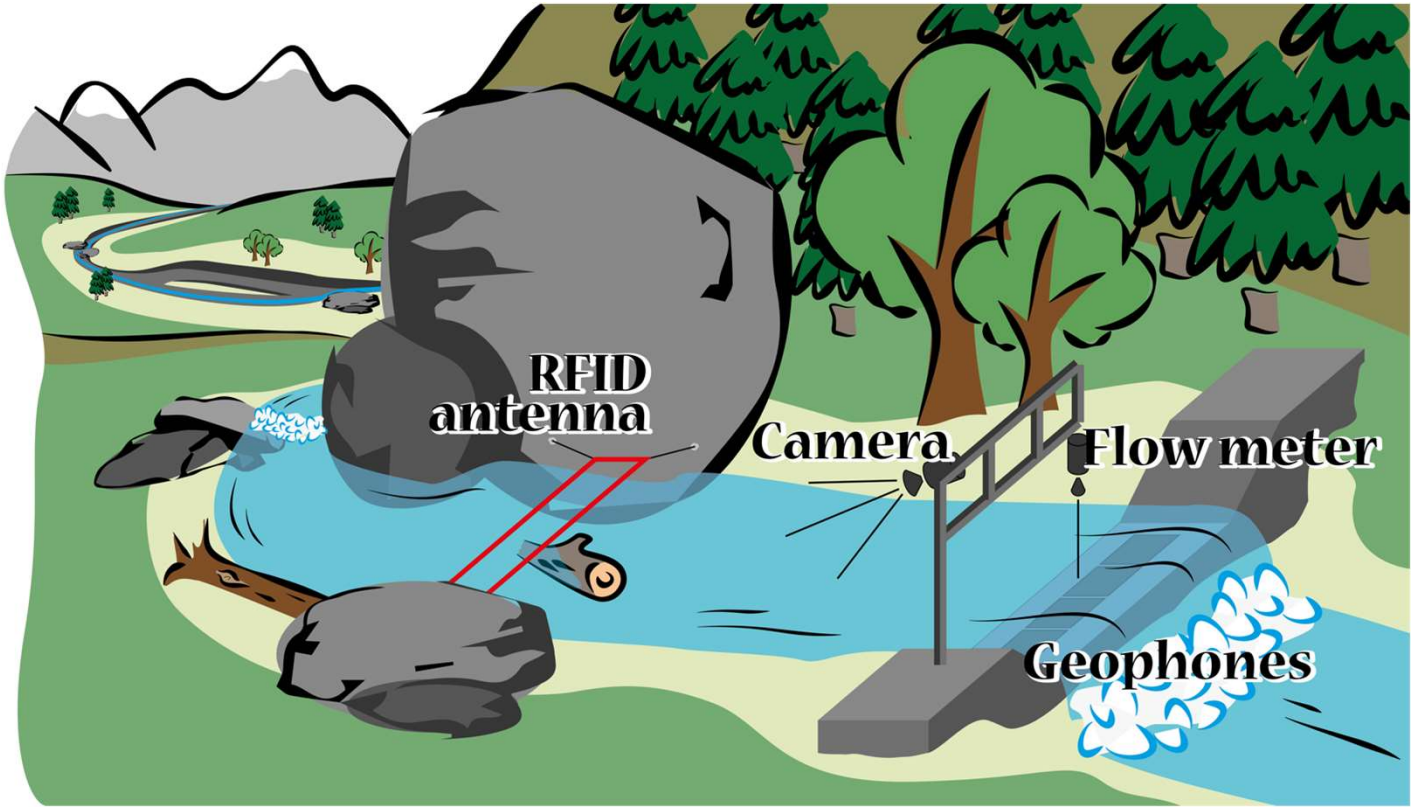
- **Machine Learning with 20 datasets**



Outlook

- **Measuring station**
- Tagging

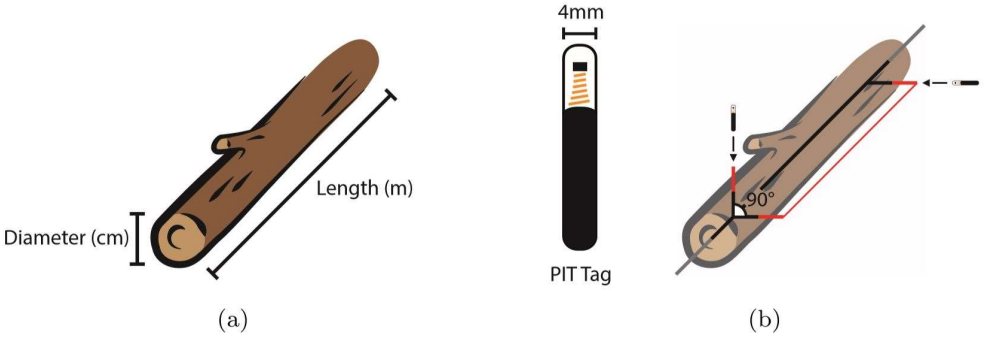




Outlook

- Measuring station
- **Tagging**

2 RFID tags



1 metal tag

Outlook

- Calibrate with (RFID) database
- Paper on wood detection with machine learning
- Continuous algorithm improvement
- Monitoring sites expansion

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