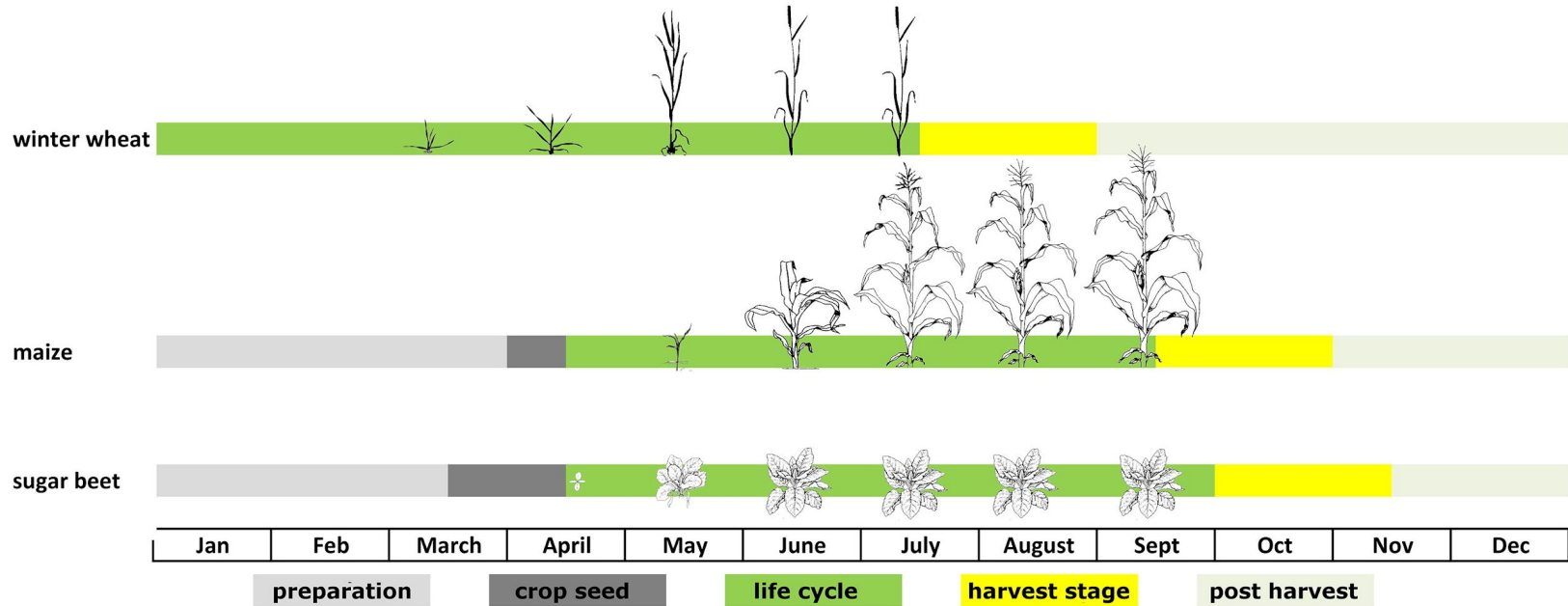


Assignment 3: Crop Mapping from Satellite Time-Series

Corresponding person: Ozgur Turkoglu
ozgur.turkoglu@geod.baug.ethz.ch

Why time-series?



Bargiel, Damian. "A new method for crop classification combining time series of radar images and crop phenology information." *Remote sensing of environment* 198 (2017): 369-383.

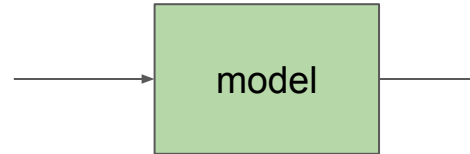
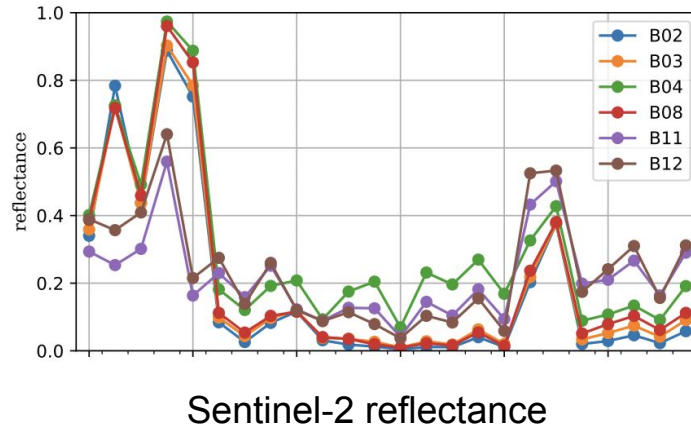
Why time-series?

Measure	Multi-temporal models						Single-temporal models					
	LSTM			RNN			CNN			SVM (baseline)		
	<i>all</i>	<i>cover</i>	<i>field</i>	<i>all</i>	<i>cover</i>	<i>field</i>	<i>all</i>	<i>cover</i>	<i>field</i>	<i>all</i>	<i>cover</i>	<i>field</i>
accuracy	90.6	93.6	74.3	89.8	92.9	72.9	89.2	93.7	64.3	40.9	87.4	31.1
AUC	98.1	97.5	94.9	97.8	97.0	94.1	95.1	97.0	84.7	87.1	97.6	81.6
kappa	77.6	55.6	67.4	76.1	53.0	65.6	66.2	56.3	44.0	38.2	83.4	27.3
precision	85.6	98.4	78.4	84.8	98.2	77.3	76.7	98.2	59.2	40.2	91.2	31.4
recall	84.4	92.5	74.5	83.4	91.8	73.0	76.8	92.7	57.2	40.9	87.4	31.1
f-score	84.6	95.3	75.3	83.6	94.9	74.0	76.1	95.3	56.7	40.3	88.9	31.1

Rußwurm, Marc, and Marco Korner. "Temporal vegetation modelling using long short-term memory networks for crop identification from medium-resolution multi-spectral satellite images." *In CVPR Workshop, 2017*.

Task: Crop mapping from satellite time series

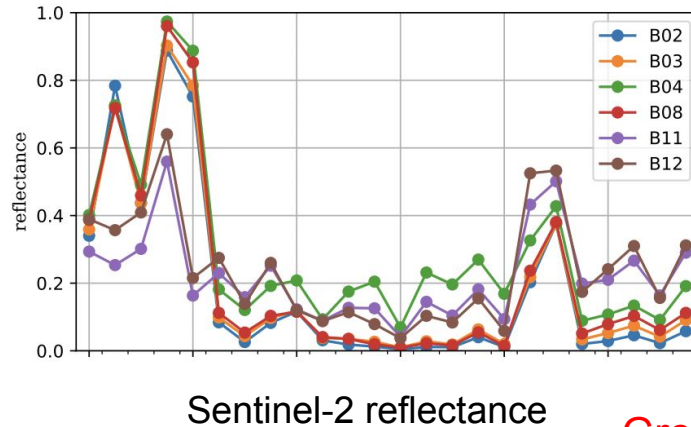
The aim of this exercise is to create a model (classifier) that automatically labels crop types from optical satellite image time series.



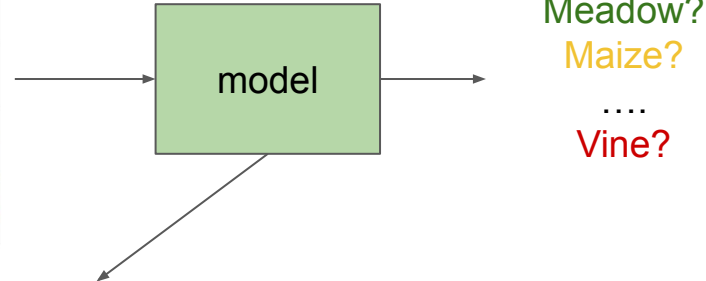
Meadow?
Maize?
....
Vine?

Task: Crop mapping from satellite time series

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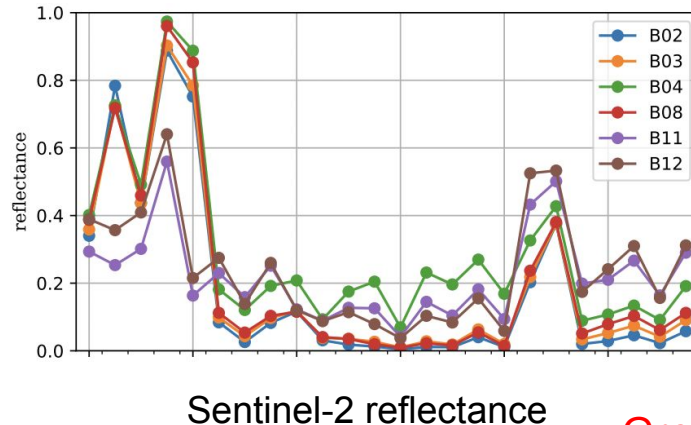


Group 1&2: RNN



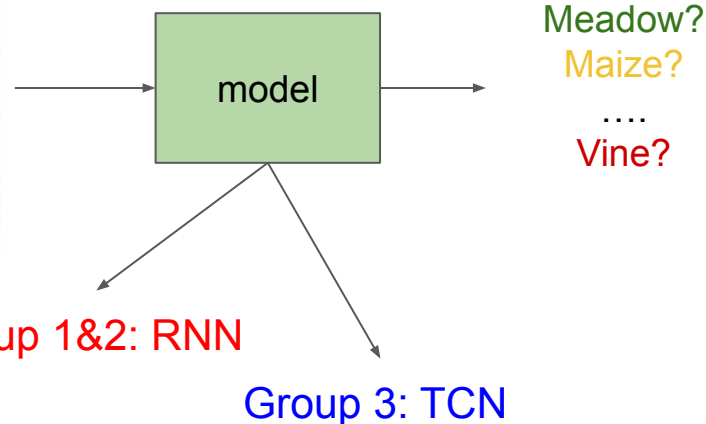
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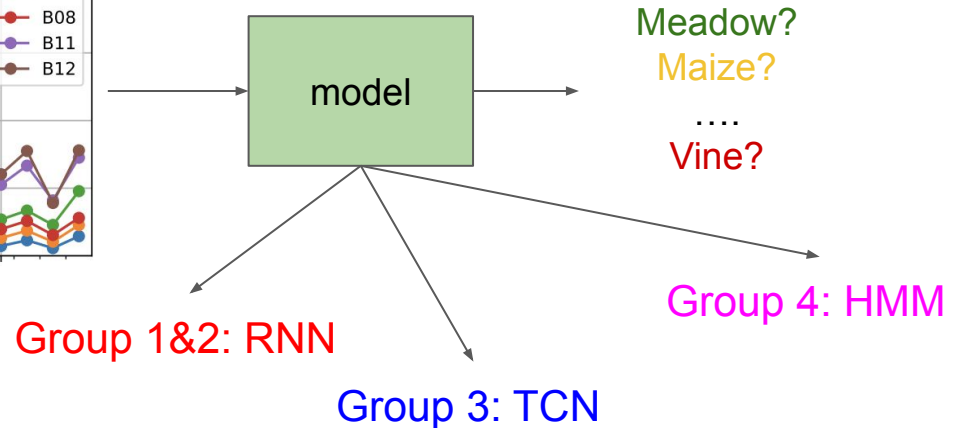
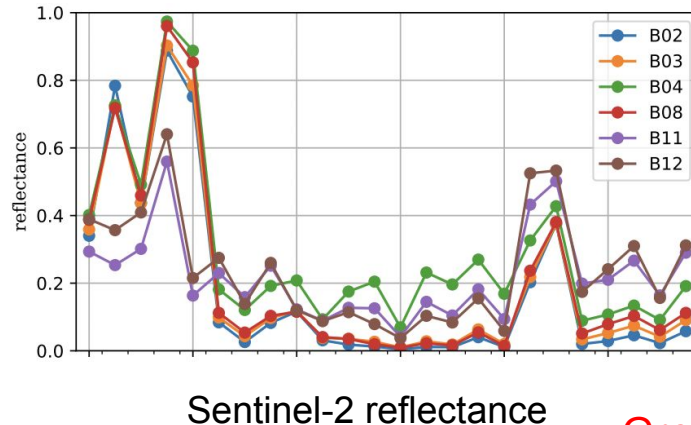
Group 1&2: RNN

Group 3: TCN



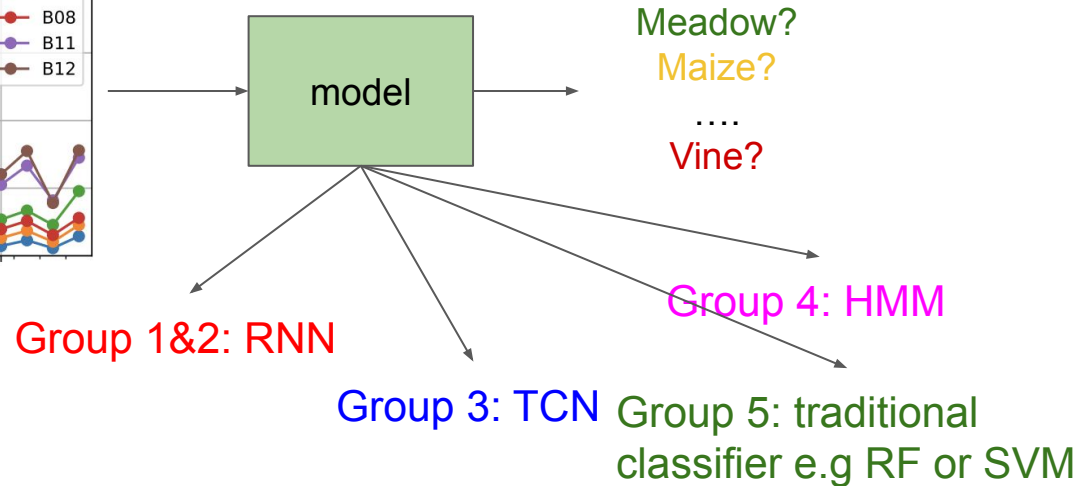
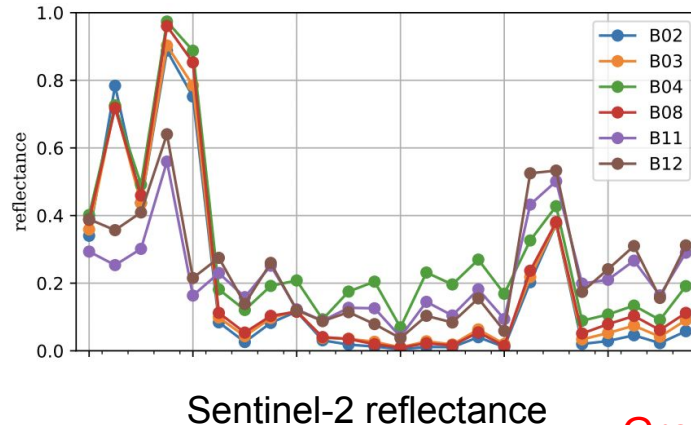
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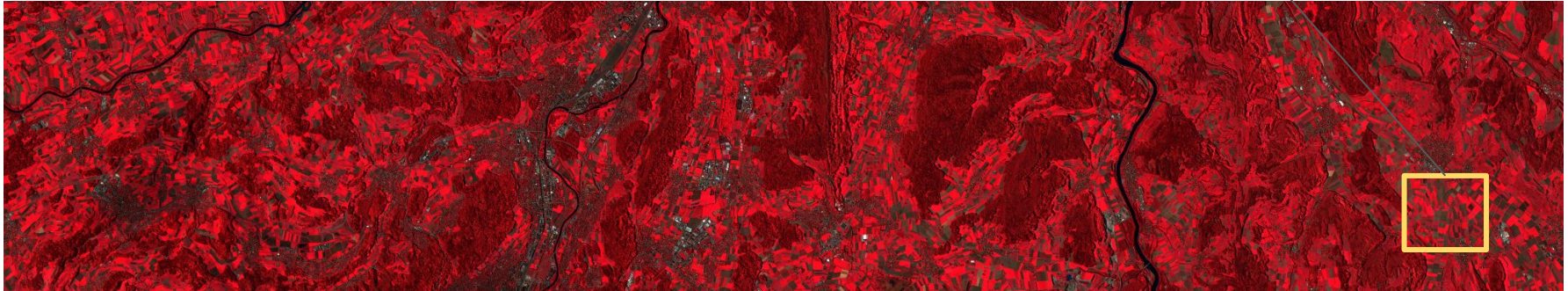
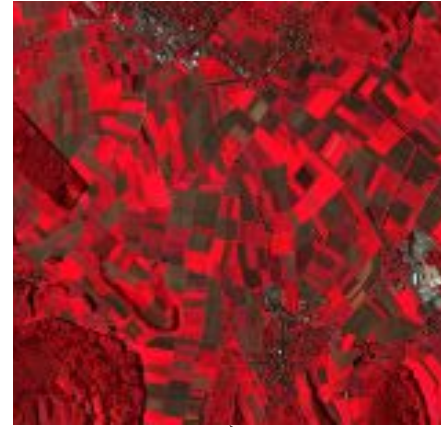


Analysis

- Quantitative
 - Accuracy
 - Training/Inference time
 - Memory requirements
- Qualitative
 - Map generation

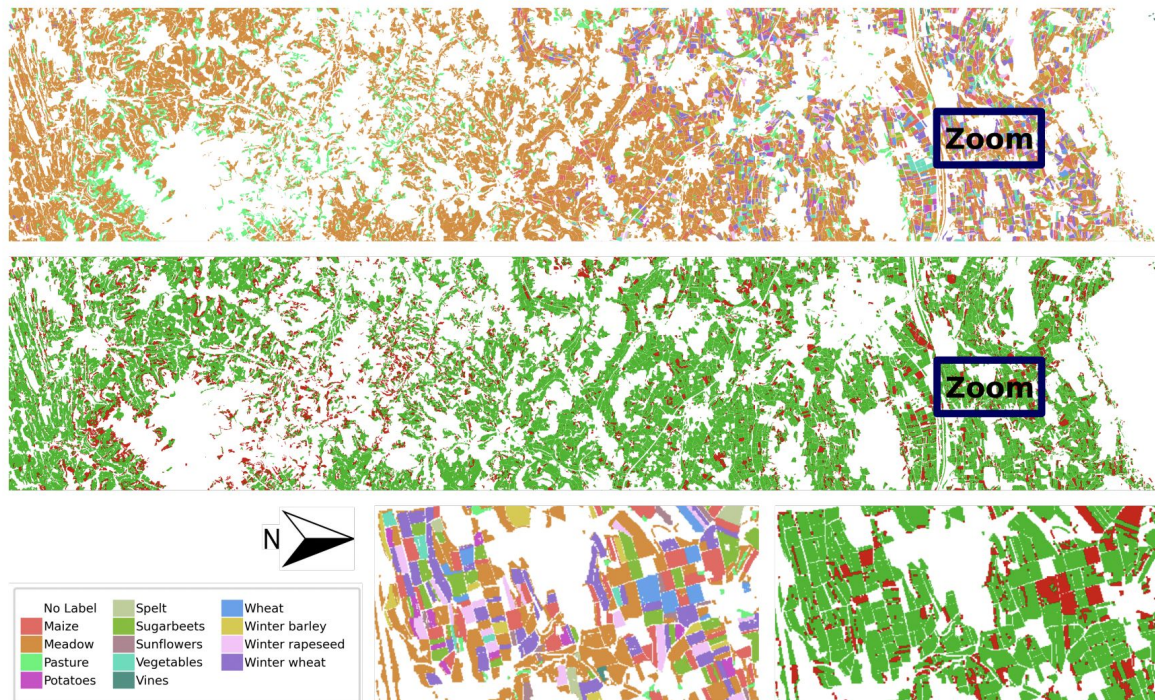
Analysis

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Analysis

- Quantitative
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Provided scripts

- Pytorch dataloader
- Visualizer code for generating map from predictions

Submission

- Git repository for the code
- Technical report (3-4 pages)
 - Description of the chosen method
 - Data processing e.g cloud masking
 - Quantitative and qualitative results
 - Discussion
 - References
- Deadline: **15 December 23:59**
- In-class presentation: **16 December 08:50**