



PRAQUE INSPIRE HACKATHON 2020

Challenge: 7

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Challenge

- 7. Testing possibilities of Sentinel 1 data for yield forecast

Why Sentinel-1?

- It is not dependent on cloud cover, weather, or part of a day
- Global coverage with temporal resolution of 6 days



Our plan

- NDVI (optical) data download
- Sentinel-1 (radar) data processing
- NDVI and SAR backscatter correlation
- Evaluation of results



NO SIGNAL



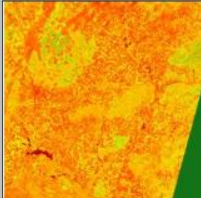
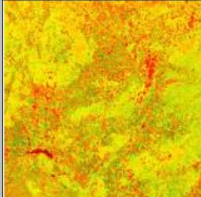
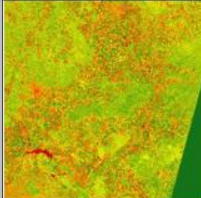
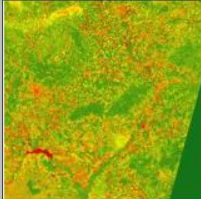
Your PC ran into a problem that it couldn't handle, and now it needs to restart.



Optical data – (Normalized difference vegetation index) NDVI

Rok:
☒ 2019
☐ 2018
 Maximální oblačnost (%):

Vyhledat

Družice	Náhled	NDVI	Scéna	List	Dráha	Obláčnost	Datum
Sentinel-2B			S2B_MSIL2A_20180322T100019_N9999_R122_T33UXQ_20190616T092620 NDVI	33UXQ	122	2.967350	2018-03-22
Sentinel-2B			S2B_MSIL2A_20180418T095029_N9999_R079_T33UXQ_20190616T045959 NDVI	33UXQ	79	17.621435	2018-04-18
Sentinel-2B			S2B_MSIL2A_20180421T100029_N9999_R122_T33UXQ_20190616T043627 NDVI	33UXQ	122	0.229332	2018-04-21
Sentinel-2A			S2A_MSIL2A_20180506T100031_N9999_R122_T33UXQ_20190616T041256 NDVI	33UXQ	122	1.385017	2018-05-06



South Moravian region

- Silage corn
- Winter wheat

Processing of Sentinel-1 SAR data

→ SNAP | Sentinel-1

Done loading modules

esa
seom
scientific exploitation
of operational missions

Graph Builder : preprocessing2020.xml

File Graphs

```
graph TD; Read[Read] --> Subset[Subset]; Subset --> ApplyOrbitFile[Apply-Orbit-File]; ApplyOrbitFile --> Calibration[Calibration]; Calibration --> SpeckleFilter[Speckle-Filter]; SpeckleFilter --> TerrainCorrection[Terrain-Correction]; TerrainCorrection --> LinearToFromdB[LinearToFromdB]; LinearToFromdB --> Write[Write];
```

Read Apply-Orbit-File Calibration Speckle-Filter Terrain-Correction LinearToFromdB Write Subset

Source Product
Name:
S1A_IW_GRDH_1SDV_20180526T050135_20180526T050200_022071_0262BA_B22E

Data Format: SENTINEL-1

Load Save Clear Note Help Run

NDVI and SAR backscatter correlation

Silage corn

Date	NDVI	VH polarization	VV polarization
2018_08_04	0,6871	-16,68705177	-9,183225632
2018_08_01	0,74499	-17,46385574	-9,774157524
2018_05_26	0,44141	-15,98784733	-10,63175011
2018_05_13	0,26052	-19,89326286	-14,62134457
Correlation		0,564291137	0,903557882

Winter wheat

Date	NDVI	VH polarization	VV polarization
2018_06_30	0,259948	-16,55436707	-12,23000908
2018_06_02	0,71788	-19,97186852	-16,66276741
2018_05_26	0,880837	-19,48394012	-16,09407616
2018_05_21	0,87757	-20,07376862	-17,07854652
2018_05_13	0,881333	-18,34368324	-12,89525032
Correlation		-0,800499812	-0,591871121



Thank you!