Work and time schedule

Task	Expecte	Real	CW													
	d hours	hours	42	43	44	45	46	47	48	49	50	51	52	1	2	3
Assignment 1	5	5														
Literature Review	5	5														
Assignment 2	5	5														
Write Python Script to	10	8														
simulate speckle noise																
Create Data sets	5	5														
Set-up Model in Python	25	20														
Train Model	10	15														
Test/evaluate/update Model	10	30														
Assignment 3	5															
Write Python Script to	15															
allow predictions of entire																
Sentinel-1 scenes (aka																
application)																
Prepare final presentation	5															
Total	100	93														

Log book:

Target: The goal is to reach a lower difference between all SAR image test patches despeckled with the own developed model and the same patches of the noise free reference compared to the difference between the same patches despeckled with a state-of-the art lee filter and the noise free reference.

Current status:

- The workflow including the model is running
- Currently the above outlined goal is not reached yet: **Difference U-Net Model and reference: 452000 dB. Difference Lee filter and reference: 3781400 dB**
- (hyper-)parameter tuning is ongoing

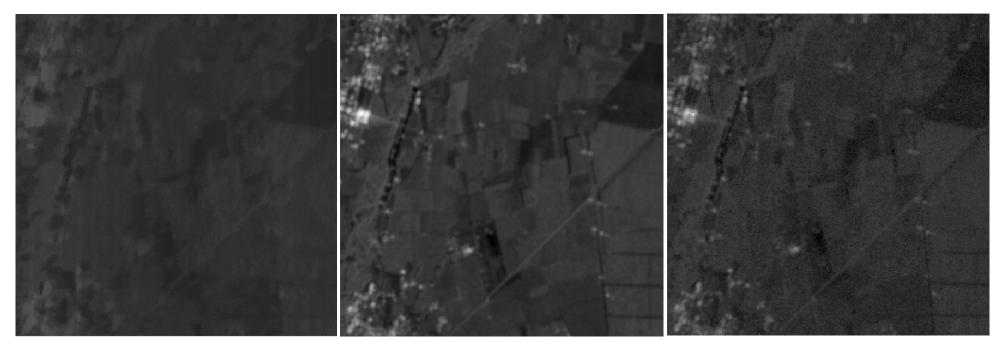


Figure 1: Example for a prediction (left), noise free reference (middle), and noisy training data (right) for a single patch.

Open issues:

- Model is not running at GPU project machine anymore.
- Smoothing effect in predictions is too strong (compare figure 1)
- Value range of predicted patches is slightly off, the range is too small (compare figure 2)
- Edges are not preserved, details are missing

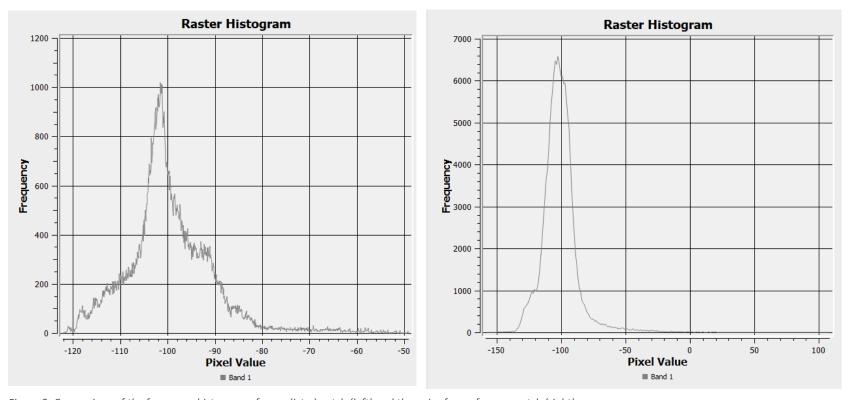


Figure 2: Comparison of the frequency histogram of a predicted patch (left) and the noise free reference patch (right)

Next steps:

- Fix issue with GPU project machine or move to different hardware
- Try different scaling/normalization
- Try different activations
- Try smaller kernel size
- Implement edge preserving blocks (e.g. HED U-Net https://arxiv.org/abs/2103.01849)
- Create application