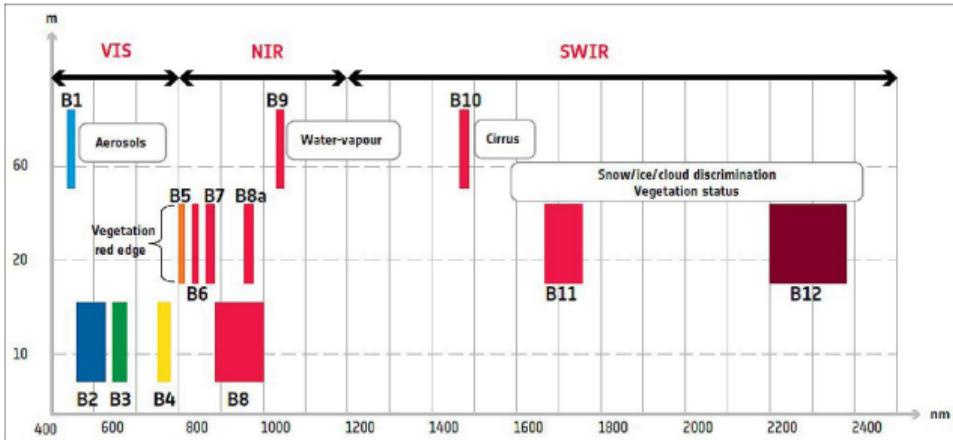




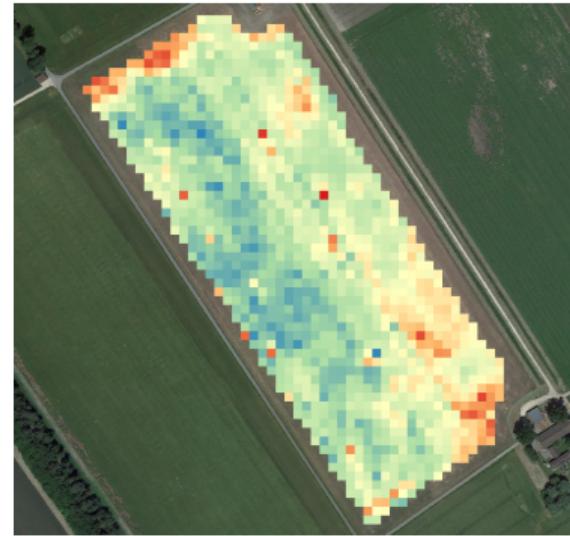
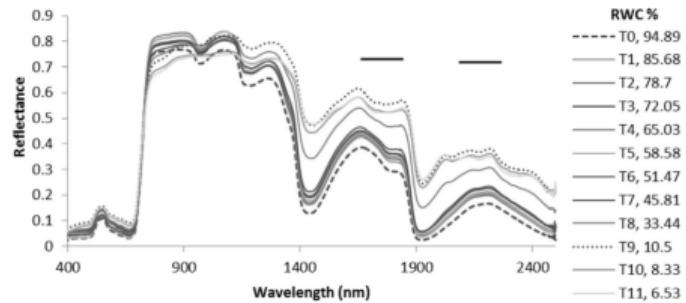
Master Thesis

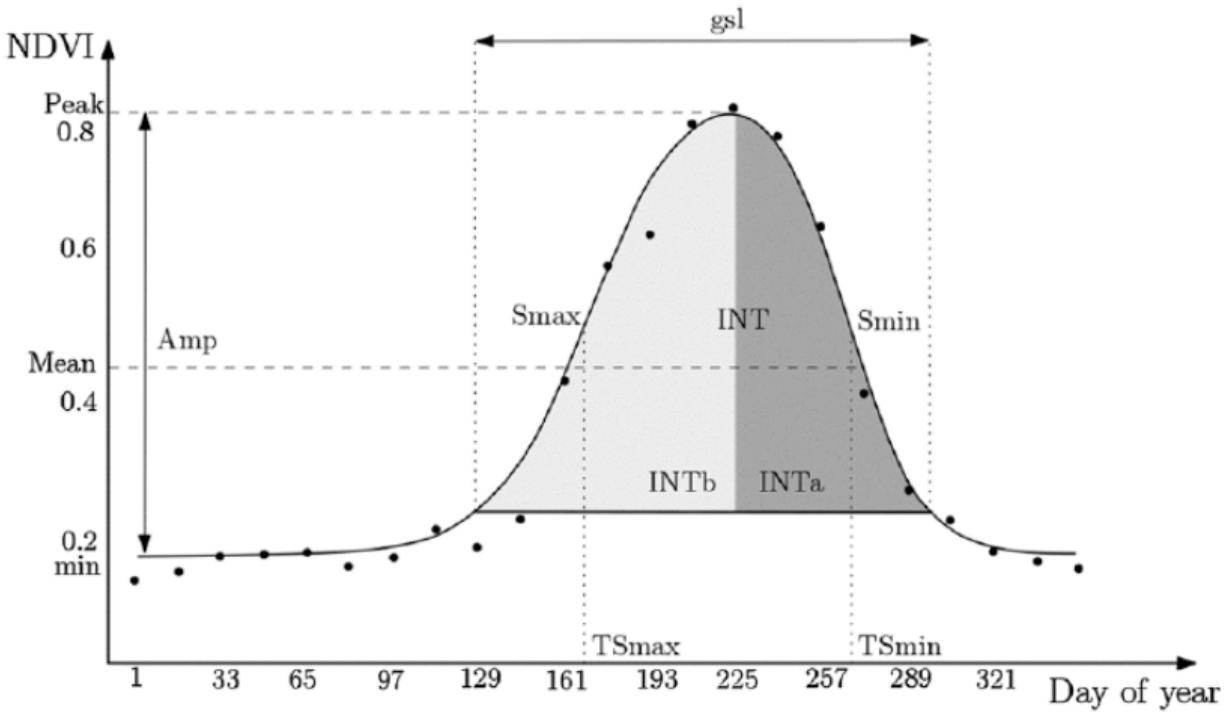
Lukas Graz
FS 2022





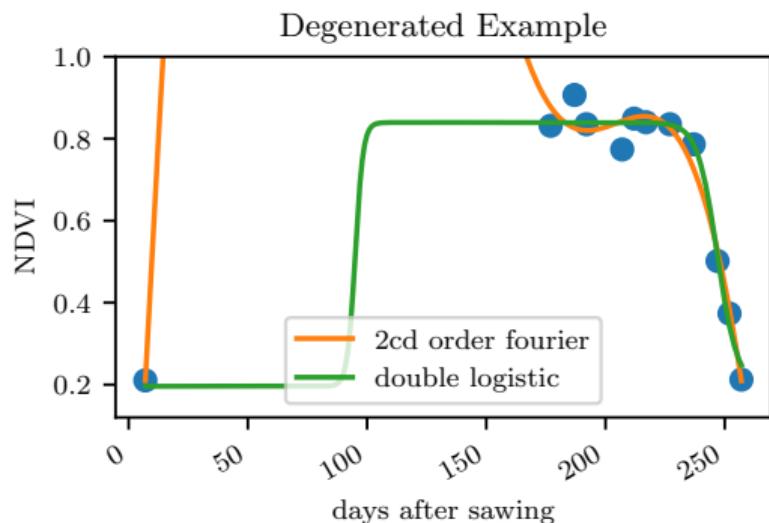
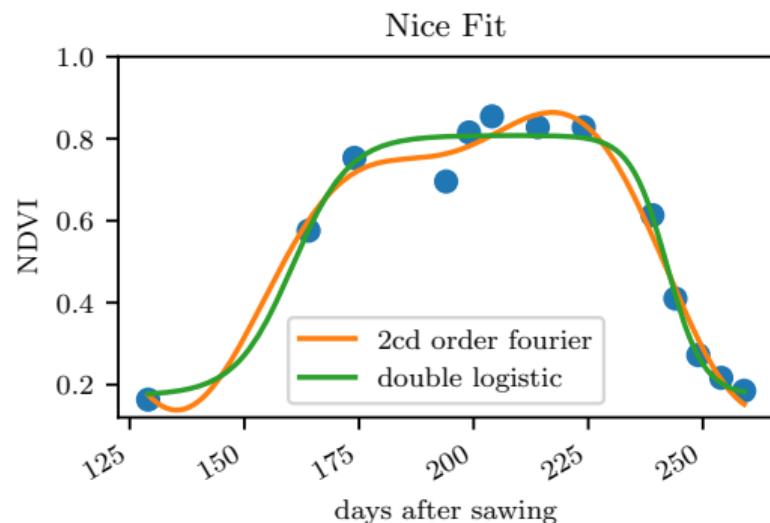
$$NDVI = \frac{(NIR - Red)}{(NIR + Red)}$$

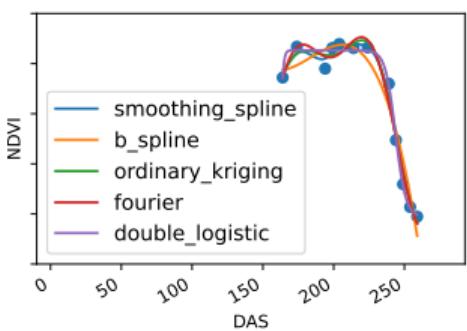
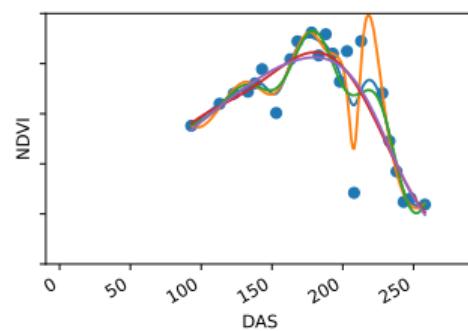
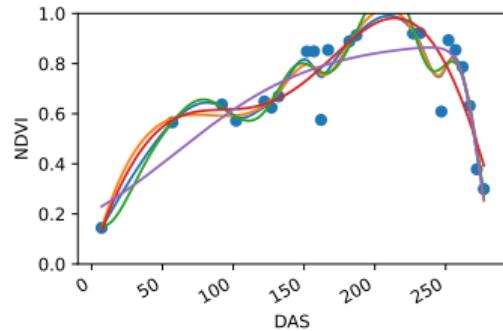
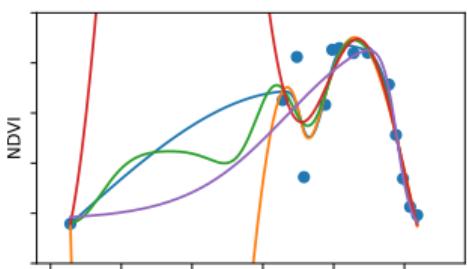
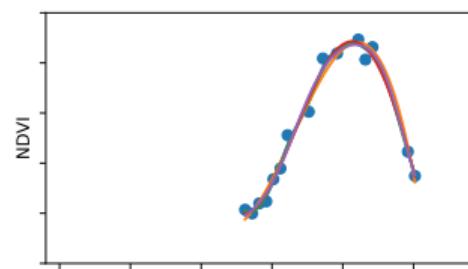
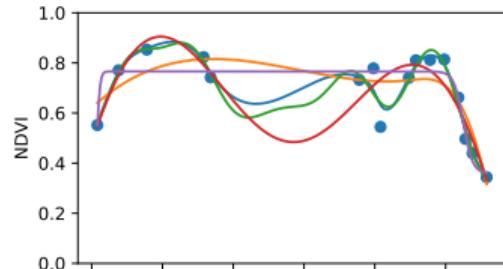
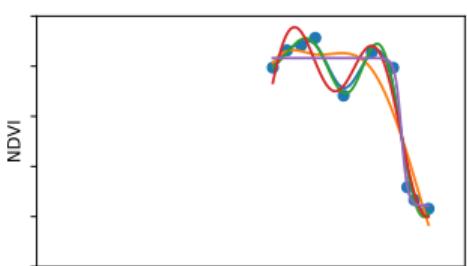
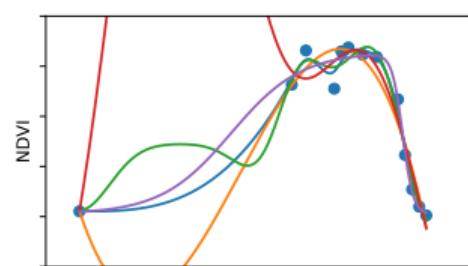
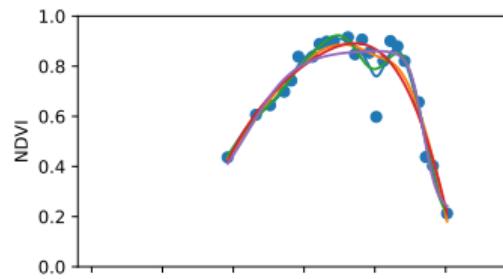




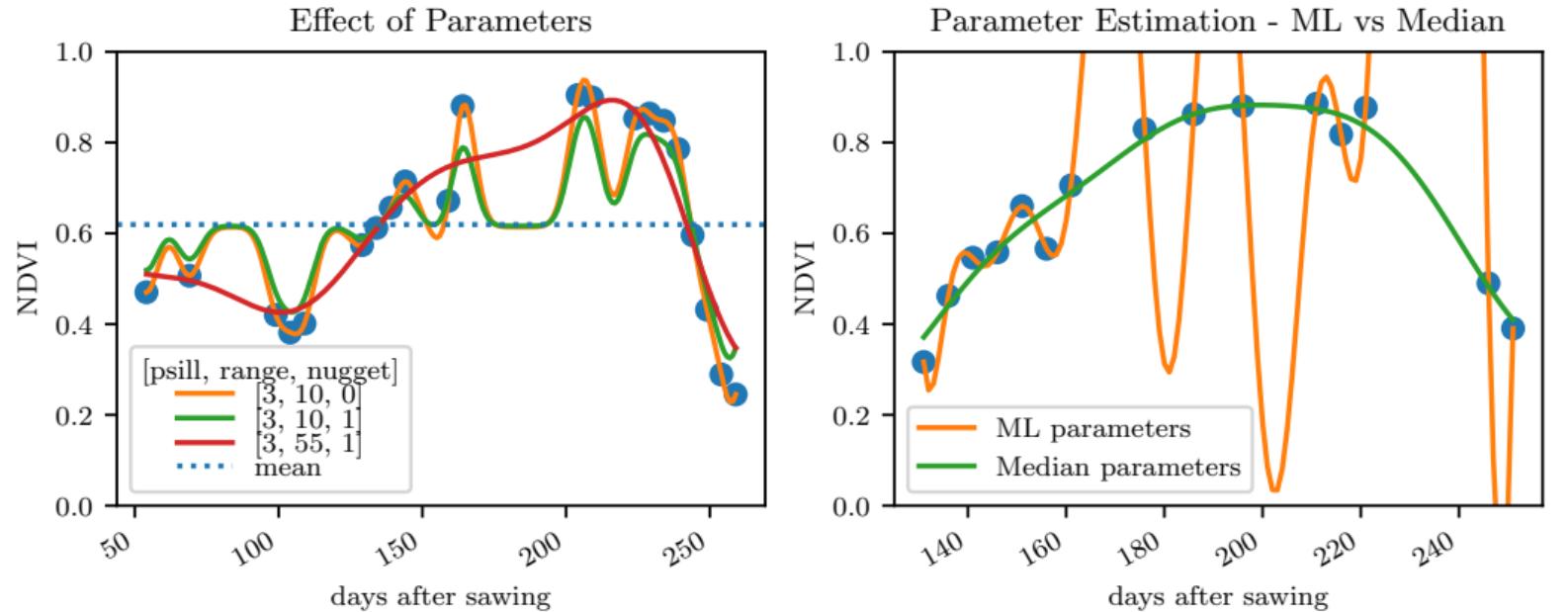
⁰taken from <https://doi.org/10.1016/j.isprsjprs.2019.11.008>

Nonparametric Regression

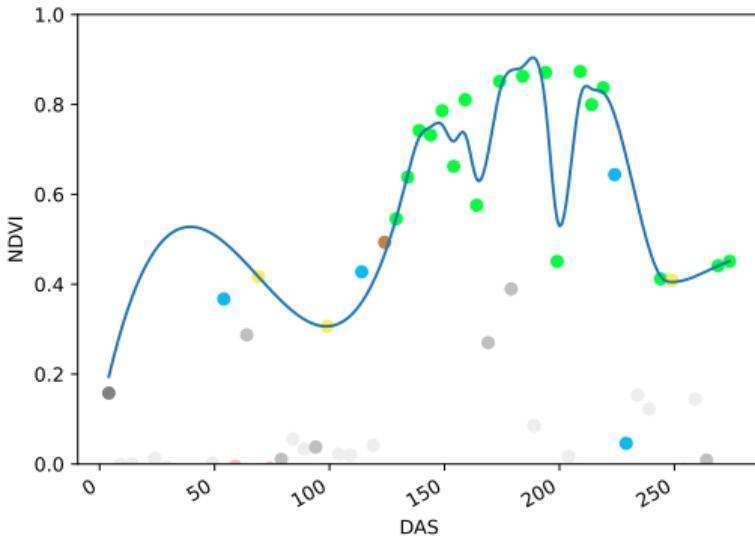




	assumptions	pros	cons	weig	bound
Savitzky-Golay filter	<ul style="list-style-type: none"> - high frequencies are noise (low.pass filter) - equidistant points - local polynomials 	<ul style="list-style-type: none"> - computationally very fast 	<ul style="list-style-type: none"> - cannot deal natively with missing data (need some interpolation) 	no	mostly
SG + NDVI	<ul style="list-style-type: none"> - upper envelope - vegetation cannot grow faster than some slope 	<ul style="list-style-type: none"> - biological knowledge 	<ul style="list-style-type: none"> - bad "upper envelope" since weights are not used for the estimation itselfe 	(no)	mostly
Loess	<ul style="list-style-type: none"> - local polynomial with points closer to the estimated point are more important 	<ul style="list-style-type: none"> - flexible - generalization of SG - weighting function makes intuitive sense 	<ul style="list-style-type: none"> - computationally expensive 	yes	mostly
Smoothing Splines	<ul style="list-style-type: none"> - 2cd derivative of function is integrable 	<ul style="list-style-type: none"> - intuitive meaning of penalty - general assumptions - flexible shape 	<ul style="list-style-type: none"> - unbounded 	yes	no
B-Splines (Smoothed)	<ul style="list-style-type: none"> - function can be approximated by a linear combination of B-splines basis functions 	<ul style="list-style-type: none"> - general assumption - flexible shape 	<ul style="list-style-type: none"> - unbounded - no intuitive meaning for smoothing 		no
(Gaussian) Kernel Smoothing		<ul style="list-style-type: none"> - simple - general assumptions 	<ul style="list-style-type: none"> - bandwidth: failes if there are big data-gaps 	yes	yes
Double-Logistic	<ul style="list-style-type: none"> - function first increases then decreases - ndvi has a minimal value 	<ul style="list-style-type: none"> - good for evergreen plants (if snow masks ndvi) - upper envelope 	<ul style="list-style-type: none"> - parameterestimation can go seriously wrong - strange behaviour for long data-gaps 	yes	mostly
Universal Kriging	<ul style="list-style-type: none"> - function is a realization of a stationary gaussian process 	<ul style="list-style-type: none"> - informative parameters - flexible 	<ul style="list-style-type: none"> - regression to the mean - assumptions clearly not met 	yes	mostly



No.	Class	Color
0	No Data (Missing data on projected tiles) (black)	
1	Saturated or defective pixel (red)	
2	Dark features / Shadows (very dark gray)	
3	Cloud shadows (dark brown)	
4	Vegetation (green)	
5	Bare soils / deserts (dark yellow)	
6	Water (dark and bright) (blue)	
7	Cloud low probability (dark gray)	
8	Cloud medium probability (gray)	
9	Cloud high probability (white)	
10	Thin cirrus (very bright blue)	
11	Snow or ice (very bright pink)	



0 scl class table from

https://mdpi-res.com/d_attachment/remotesensing/remotesensing-13-00300/article_deploy/remotesensing-13-00300-v2.pdf?version=1611106659

