FOTETRAF

Advanced computational methodologies on open big data for forest terrain trafficability monitoring and forecasting

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Background

The focus is to develop the utilization of big open data and computational methodologies to estimate and forecast forest terrain trafficability. The goals are:

- improving big data analysis methods for dynamic trafficability prediction models
- create cloud computing based data environment that enables real-time data flow from operational forest machines all the way to trafficability forecasts
- improving the cost efficiency and sustainability of forestry

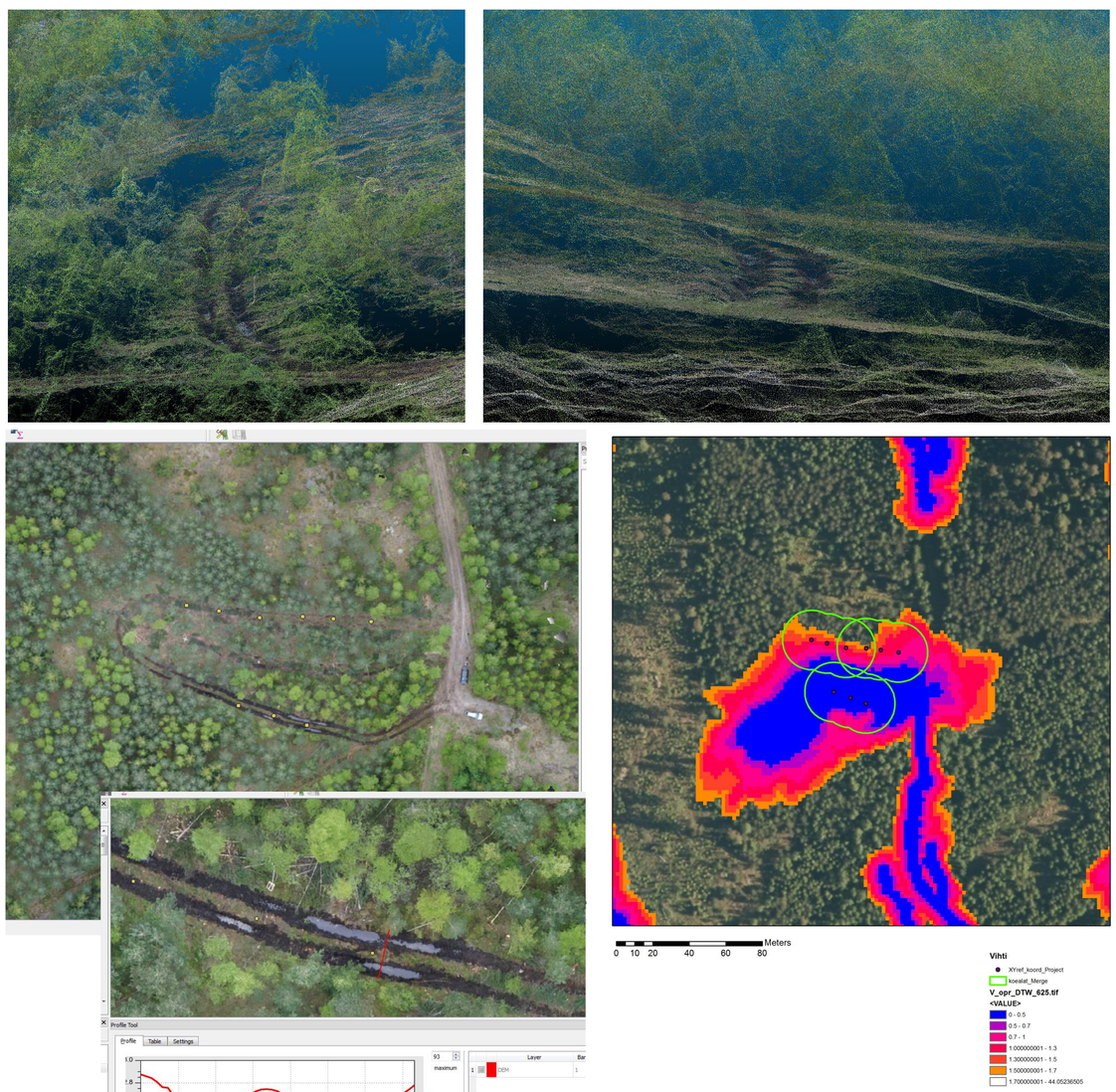
Research setting

❖ Offline & online data from the field and secondary spatio-temporal data on environment and weather

❖ Cloud-based Data Environment

❖ Dynamic Modelling of soil moisture and hydraulic conductivity properties combined with probabilistic and information theoretical data analysis for forest trafficability

❖ Forest Trafficability Application demo



Preliminary results:

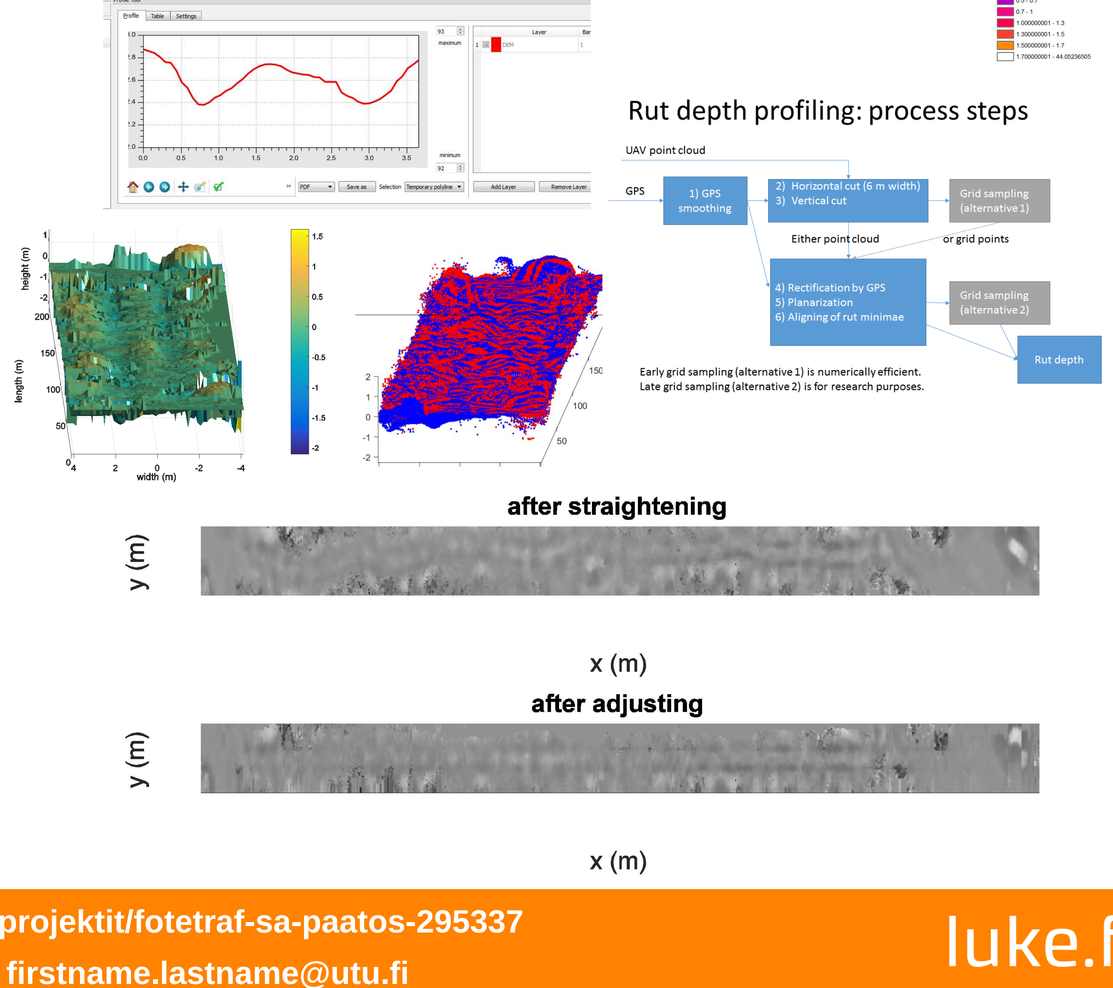
❖ a cost-benefit evaluation of the three remote sensing methods (aerial photography by a drone, 2d laser scanner attached to forest harvester / forwarder, and kinect depth camera) and their potential to measure rut depths associated with forest harvesting operations in field conditions.

❖ Automated rut depth extraction from photogrammetric point cloud data

❖ CAN-bus data applicability for trafficability and rut formation measurements

❖ Digital Elevation Model derivatives for the test sites: cartographic depth to water index among other indices e.g. for soil moisture, solar radiation and microtopography

❖ set-up for enhanced TOPMODEL for spatiotemporal modelling and forecasting of the rut formation and forest trafficability



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