**Proposal for Semester Project**

Patterns & Trends in Environmental Data / Computational Movement Analysis Geo 880 FS2021

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| **Stud 1 Gubelmann/ Yves /** 14522007  **Stud 1 Wildhaber / Tobias /** 15555063  **tbd** | Which option do you choose:   * Option A: Wild boar data * Find nesting sites |

**Abstract** (50-60 words)

Yves

**Research questions**

Using the already known wild boar data from the research project "Prevention of Wild Boar Damage in Agriculture" as a basis, we want to answer the following research questions:

How can resting sites be modelled based on spatiotemperal movement data?

Can locations frequently visited by wild boar be determined efficiently and effectively in the research data provided?

Can these regular resting places be clearly defined as kettles or wallows?

R**esults/products**

Rastered heatmap with nesting sites, differentiated by wallows and nests

Can be filtered by seasons and animalID, context of land coverage (Arealstatistik)

…

**Data**

Tobias

Wildschwein data (moodle), Arealstatistik und andere Daten von Swisstopo (LIDAR-Daten)

Vegetation Model (Forest Inventory) 🡪 digital surface models DSM and digital terrain model by swisstopo

Feldaufnahmen / Kulturtypen

**Analytical concepts**

To gain more meaningful movement data, we will start with segmentation. The segmentation process will be based on predefined movement properties (e.g. speed, steplength) which need to be readjusted multiple times and reviewed in a critical manner. The resulting trajectories will then be annotated with a status (“resting”, “moving”) and joined with land use type what will provide context. Finally, for each resting trajectory a convex hull will be calculated to visualize the results.

**R concepts, functions, packages**

We will rely on established and widely used packages, namely tidyverse, lubridate, TERRA and tmap. Tidyverse will be used for maintaining our data clean and tidy data wrangling and visualization of simple plots. More sophisticated plots like convex hulls will be done with tmap and TERRA. Lubridate will be mainly used for handling time and date variables, especially its round function.

**Risk analysis**

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Findig clear criteria (in literature) to define and identify nests and wallows

Handling raster data in plots

Plan B: no differentiation between nests and wallows, just identifying häufige Aufenthaltsorte

**Questions**

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Welche Methodik ist aus Sicht Tutor sinnvoller für unsere Fragestellung?