Sulejowek Tree Value Solution

Hack The Climate 2023

HATCLI_Tonio HATCLI_Jonh HATCLI_Novart

Maria Curie Sklodowska University

2023-11-26

INTRODUCTION

- Sulejowek Tree Value Solution was developed to address the challenge of uncontrolled tree felling in the city of Sulejowek as introduced by the Sulejowek local government in the hackathon “Hack the Climate 2023”.
- The entire solution was realized in R programming using a variety of libraries that enabled the infrastructures that make up the solution.

DEVELOPMENT PROCESS

- This involved three major steps namely Initialization and EDA (Exploratory Data Analysis) Data splitting and model training UI and Server Infrastructure

Initializing and EDA

- This comprised of data loading and preprocessing to understand and quantify the data that would be used to build the algorithm for the trees counting process.

Data Splitting and Model training

- This comprised splitting the data into training and testing sets using the 80/20 ratio. The aim was to develop a machine learning algorithm using the Random Forest classification model to classify the trees in terms of tree species (species by common names), trees circumference from DBH, and using the permit application process as the decision parameter.

UI and Server Infrastructure

- This involved developing the user interface where the Sulejowek community who want to fell trees will input the specie and circumference of the tree (after computing the DBH) and also the reason for felling (whether for business/agriculture activity or not) and whether the tree was fell by forces of nature.
- The server will compute the value of the tree and suggest a decision whether or not the person is required to file for a permit first, report the incident without filing for a permit, or just going ahead with felling the tree.
- We also included language options in both English and Polish for easy use.