Project description:

# #2. Image analysis of root growth (root)

Client: University of Helsinki, INAR/forest

Description: Tree root growth dynamics are not well understood even though they are a key element in the carbon cycle of forested ecosystems. In order to monitor tree root growth, we installed normal office scanner belowground and took thousands of daily images. The goal is to automatically analyse daily root length (and/or root area) in the images and to calculate daily root growth.

Data and tools: The data consist of two (to three) years of daily scanner images of root growth at two forested sites (Värriö SMEARI and Hyytiälä SMEARII). The work would need tools for image analysis/recognition. The roots are growing or just staying there but there are also some challenges such as animals (such as worms) passing by, steam or condensed water, fungal growth, change in root color during maturation etc. We have analysed a great deal of the images manually so there is a training material available but for future, it would be handy to have a automatic tool for analysing the growth.

# Group memorandum:

**Group members:**
Dennis Muiruri (dennis.muiruri@helsinki.fi)
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**Name of your project and topic and date of your data science tools presentation:**
Image analysis of root growth (root)
Date of Data science tools presentation 2nd February

**The chosen methods of collaboration for your group (which collaboration tools to use, how often to meet, how to manage the project etc.) and tentative division of labour (if applicable).**
Daily communication: Telegram
Meetings when needed: Zoom
Tentative division of labour: Agreed after the client meeting

**Tentative list of tools planned to be used (to the extent possible and with the understanding that the tools may change depending on the discussions with the client)**

- Software:
  - Version control system: Git
  - Programming languages: Python
- Machine learning libraries, platforms etc:
  - Scikit-image, OpenCV,

**The next steps: what to do next, when to meet next, how to contact the client, who will do what etc.**
Olga will send email to the client and we will ask when we could have the first meeting.

**Any other issues of relevance.**
Nope