Transnational Access at UGCT: an overview of 4 years Trees4Future

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ABSTRACT

Trees4Future (T4F) is an Integrative European Research Infrastructure project that aims to integrate, develop and improve major forest genetics and forestry research infrastructures. T4F aims to support forest research and help the European forestry and wood industries to develop sustainable solutions for the future in the context of climate change, by improving and facilitating access to state-of-the-art research facilities throughout Europe. A "continuously – open" mechanism is applied to gather/select proposals in 2 stages, through external reviewing. At UGCT, more specifically Woodlab-UGent, we offer access to the Nanowood scanner, but access has also been given to HECTOR (Figure 1) for different research projects. Nine visitors have had access to the facilities so far. We briefly report on the different projects and the variety of research questions tackled using CT scanning by the international tree and wood community:

1. **Ecophysiology**
   a. Real-time cavitation on different tree species has been studied, in combination with other measurements on the same samples (2 different missions)
   b. The impact of sapflow sensors has been investigated at different scales;
   c. Drought impact on different willow clones has been investigated by looking at density and anatomy of several samples, combining conventional light microscopy and CT.
2. **Material science**
   a. Different wood modification processes have been used to treat softwood and samples have been looked at using submicron resolution, quantifying porosity and bulking;
   b. Anatomical structures linked to discolouration of robinia, a valuable wood species in Eastern Europe, has been studied and visualized using CT;
   c. Localization of micronized copper is a debate in wood protection; submicron CT scanning has been used to elucidate the reservoir effect;
   d. Cork stopper quality has been assessed using CT scanning, linking cork porosity to oxygen ingress (Oliveira et al. 2015).
3. **Modelling**
   a. Different wood species have been scanned and analysed to be used as 3D input masks for wood moisture modelling.
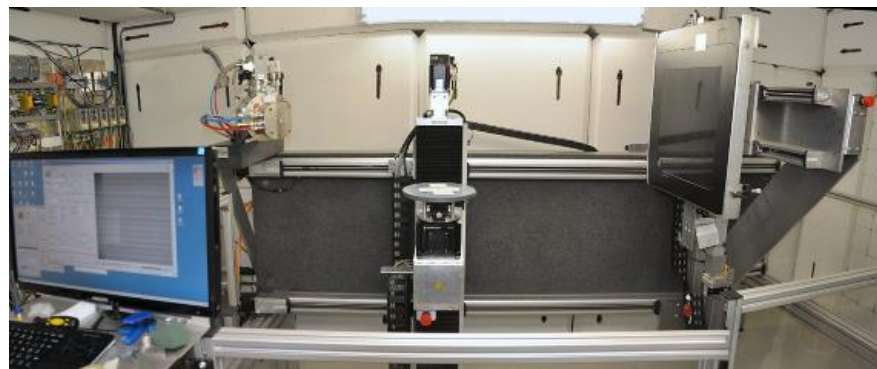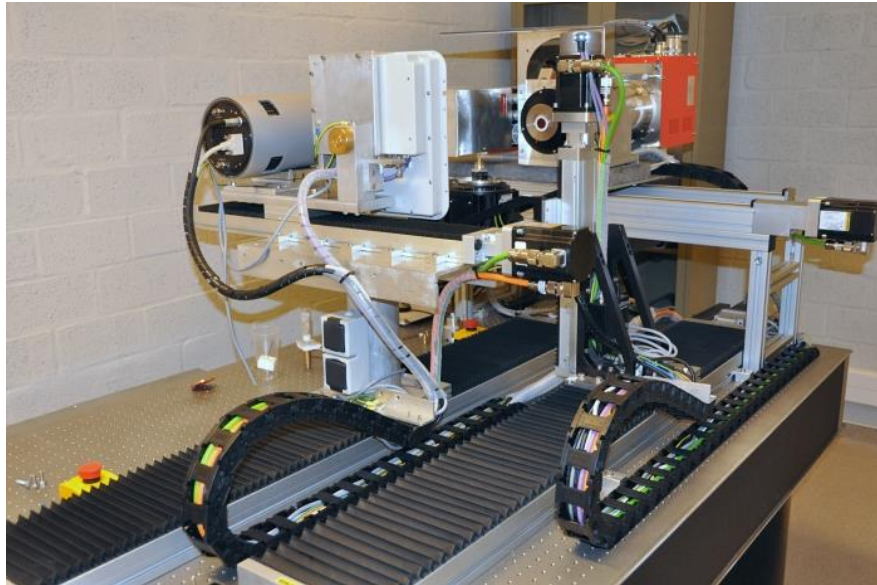
Figure 1: the NanoWood (top) and HECTOR (bottom) scanner at UGCT (Dierick et al. 2014, Masschaele et al. 2013)

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