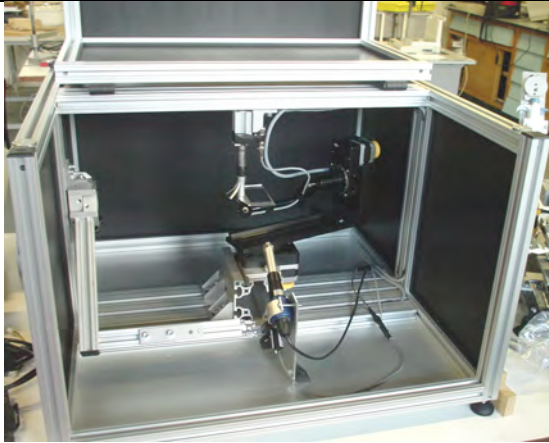


surface gloss

Technical details



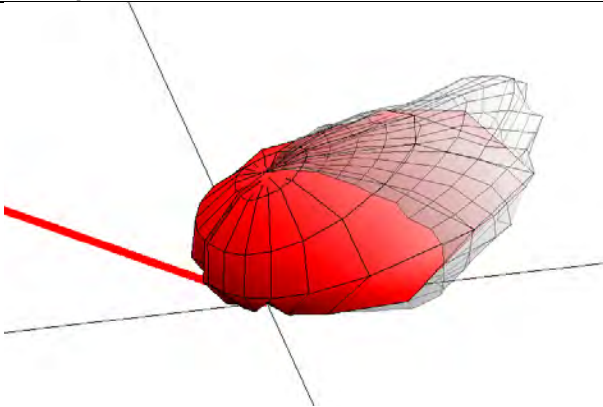
goniometer; 3D gloss scanner

Type: custom

Producer: IVALSA/CNR (Jakub Sandak)

- photodiode (and amplifier) by Hamamatsu
- two axis motion control system
- two sources of light:
 - laser (red)
 - LED (white)
- large area of surface to be measured
- shadow box

Example of results



The raw result of measurement is a series of data indicating the quantity of light reflected from the surface in the direction of the photo detector. By moving the detector, the 3D map of the reflectance can be scrutinized.

The further interpretation allows estimation of:

- bi-directional reflectance function
- type of light reflection
- scatter (Lambertian) reflection
- mirror-like reflection
- light absorption

Technique description

One of the most important, but sometimes underestimated properties of the surface is the light reflectance or gloss. In general there are three types of interactions when light hits a surface: reflection, absorption, transmittance.

The light interaction with wood is especially complex therefore the standard techniques of the reflectance measurement with gloss-meter are very limited. The alternative is: instead of measuring only one direction of the light reflection, measure the whole sphere. It is known from literature as Bi-Directional Reflectance Function (BDRF). For estimation of the BDRF custom gonioreflectometer has been developed at IVALSA/CNR. The quantity and quality of information is superior to the standard gloss-meters, but in the same time the algorithm for data processing is much more complex. It is rather difficult to present the reflectance type by one numerical expression, therefore some simple and intuitive algorithms for computation of the numerical indicators (calculated on the base of BDRF) are developed.

Comments

The instrument is a prototype, under continuous development at IVALSA/CNR.

Contact person: **Jakub Sandak (Sworfish)**