Semester Project at Laboratory for Timber Constructions – Call for applications: “In-hand Object Scanning for Timber/Stone Scraps Digitalization”

On the left: “IN-hand Object Scanning via RGB-D Video Segmentation”, Fan Wang, Kris Hauser, ICRA2019, the paper shows an in-hand method of scanning. On the right: one of the stone scraps fully scanned and processed at IBOIS.

The laboratory for timber constructions, IBOIS, is conducting research on the influence of digital fabrication techniques for the design of timber structures. Recently, we have been interested in the digitization and construction of hybrid timber-stone structures. In order to assemble and digitalize such structures, we are confronted with numerous irregular and unpredictable stone elements that need to be scanned. An in-hand scanning technique seems to be the most agile and practical way to approach this digitalization process.

**Goal**

The goals of the student are to: a) prepare a state-of-the-art of in-hand scanning, b) establish a strategy for in-hand scanning, c) from open-source or appropriate resources build a functioning application to achieve batch in-hand scanning.

**Skills**

- Basic knowledge of point cloud processing and computer vision
- Programming knowledge in C++ and/or Python (C# is a plus)
- Creative mindset and problem-solving skills

**Facility**

The student will be able to use an in-handle scanner FARO Freestyle2 for digitalization of timber elements and will benefit from the resources of the Structural Engineering Group testing laboratory (testing halls, diverse equipment). The multi-disciplinary team of IBOIS will supervise and assist him in his work. In addition, he will also have at disposal a budget for the purchase of possible extra IT-equipment needed for the task (RGB-D cameras, TOF cameras, etc’..).

**Planning**

Week 3: work plan based on state-of-the-art techniques
Week 6: stand-up meeting and team discussion
Week 8: Intermediate presentation
Week 11: stand-up meeting and team discussion
Week 14: Report and final presentation

Interested students can send an email to andrea.settimi@epfl.ch