Sketching procedural game worlds

Advisors

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Context

Creating 3D worlds is a tedious task and often requires hours of modeling and placing. Many tools have been developed to try and tackle this issue, but these are rarely intuitive for novice users, and they are often limited by the use of a mouse. In this internship, we would like to tackle these two issues through a new physical interface that tracks user gestures.

Objectives

The goal of the internship will be to use a hand-held physical device to sketch simple scenes with pre-defined object categories (houses, trees, rivers, bridges, etc.) by interpreting user gestures and determining parameters of procedural models for each object class.

The problems to be addressed are as follows :

- Propose a method to recognize simple shapes from hand-made single-stroke sketches
- Match the detected shape with a corresponding parametrized 3D model
- Propose editing methods of the 3D models using the physical device (extrusion, rotation, translation…)
- Automatically decorate the 3D model with a procedural method (windows on buildings, leaves on trees, wrinkles on clothes…).
- Optionally, bind the produced tools with an augmented reality environment.

Work environment

During the internship, the student will interact with ISKN, a local company proposing the tracking device. The implementation will be organized as Unity assets. Note that a Unity experience is not mandatory, only a plus. The internship is likely to lead to a joint INRIA-ISKN PhD thesis (CIFRE) on a related topic.

Keywords

Tangible interaction, multimodal interaction, procedural modeling, shape recognition, sketch-based modeling

References

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