

# **Semi-Automatic Facades Modeling based on Image References**

## **Master of Science in Interactive Entertainment Technology**

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3D building reconstruction is an emerging field in image processing and computer vision that aims to create 3D representation of various objects, scenes from image sets and etc. One aspect that is still lacking, however, is a way to reconstruct high quality facade elements such as windows and other domain related details. These are usually not noticed when seen from a frontal viewport or are used in a background models, where high details are not essential. But when the reconstructed model is viewed from certain angles or realistic look is the main requirement, the lack of details leap out. Therefore the aim of this dissertation is to reconstruct a 3D model with refined details based on facade image references. The application has been developed that combines an automatic detection algorithms and user interactive experience to create a 3d model based on the rectified facade images. The application pipeline consists of four stages: high-level structure extraction based on vertical and horizontal edges profiling, windows detection, low-level window elements extraction based on Line Segment using Weighted Mean Shift and user interactive tools, and the last stage is responsible for creating a 3D model of the facade.