

This thesis describes a procedural hair generator that is able to generate hair from just a few hairs, called hair guides, which are directly modeled by a 3d artist. The procedural hair generator is a part of Stubble project -- a tool for hair modeling in Autodesk Maya. The procedural hair generator can generate hair during rendering, thus avoiding storage of hair geometry in a scene file, which makes the rendering process very efficient. Furthermore, hair can be generated interactively and displayed by OpenGL during modeling in Maya. Generated hair geometry is mainly defined by interpolation from the mentioned hair guides; however it is also influenced by many hair properties. These properties can change hair geometry using noise functions, define hair color, width and more. To determine hair root positions on a given triangular mesh I use my own mesh sampling algorithm that generates random samples on a triangular mesh according to a density defined by a 2-dimensional texture. My sampling algorithm uses an innovative way of sampling from a discrete probability distribution, which can be used in other applications than mesh sampling.