

Kurzfassung der Studienarbeit

Abteilung	Informatik
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Titel der Studienarbeit	Tangible – A Python library to convert data into tangible 3D models.
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Themengebiet	Software / Compilers
Institut	Institut für Internet-Technologien und -Anwendungen

In the past, making data tangible was a complicated, manual process. Digital 3D representations of complex data have been around for quite a while, but they were always confined to the digital world. Mostly because it was impractical to convert a digital model to a physical representation.

With the advent of cheap, affordable 3D printers, this changed. It is now easy to convert a purely digital model to a tangible, physical object. The missing piece in the process of making data tangible is the conversion of data to a digital 3D model.

This thesis wants to solve that problem by providing an easy to use software library with “batteries included” that can convert arbitrary numeric data to 3D models. The library – named Tangible – is written in Python and provides a set of predefined but customizable shapes, a few tools to preprocess data and a backend implementation for OpenSCAD, an open source programmatic CAD software.

Tangible is implemented as a cross-compiler with a simple abstract syntax tree (AST), a set of shapes that build on top of the AST and an interface that allows the creation of different code generation backends.

The library is ready to use, well tested and thoroughly documented. It has been released under an open source license and is available online at <https://github.com/dbrgn/tangible>.