Bavarian Graduate School of Computational Engineering
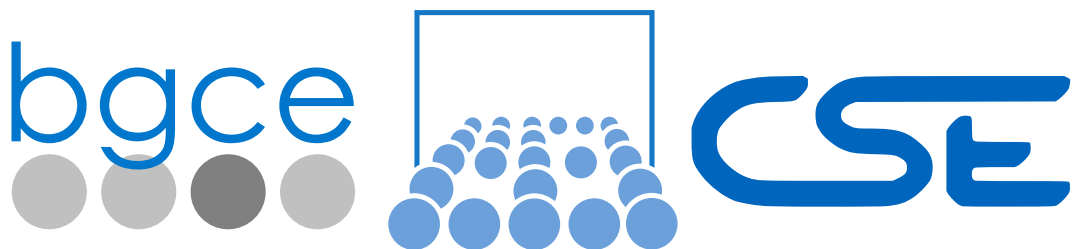
Technische Universität München

Installation Guide

CADTOPCAD-a CAD to Optimized Topology to CAD Software Tool

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Preface

The Bavarian Graduate School of Computational Engineering (BGCE) honours project at the Computational Science and Engineering (CSE) Institute of Technische Universität München (TUM) is a 10-month project where students conduct research on cutting-edge topics in the field of Computational Engineering, in cooperation with a partner in industry or academia. The 2015–16 project is titled *CAD-Integrated Topology Optimization* and is initiated and supervised in a cooperation between TUM and Siemens AG in Munich.

Acknowledgments

Todo list

Contents

1 ToPy

1.1 Prerequisites

For installing Topy, we need some additional software beforehand.

- Python (>2.7)

- Numpy (Usually provided by Python distribution)

- Pyvtk:
    - sudo apt-get install python-pip
    - sudo pip install pyvtk

- Pysparse:
    - Since pip does not work we use:
    - git clone git::://pysparse.git.sourceforge.net/gitroot/pysparse/pysparse/
    - cd pysparse
    - sudo python setup.py install

Furthermore, since by default the output .vtk files from Topy are binary, we need to change them to ascii. Hence, in the Topy source file `core/visualization.py` in the method `_write_legace_vtu(x, fname)` (line 160), change in line 194 `binary` to `ascii`. _____ Code picture

1.2 Install ToPy

Finally, we can install Topy by calling
```
sudo python setup.py install
```
in the root directory of Topy.

1.3 Test Installation

Enter one of the folders in examples (e.g. examples/cantilever) and execute a Topy test run by
```
python optimize.py <example.tpd-file>
```
_____ Output picture

2 OpenCascade

2.1 Install OpenCascade

We do not use OpenCascade from the official webpage but from the Git repository:

- git clone git://github.com/tpaviot/oce.git

- cd oce

- mkdir build

- cmake .. `Output picture`

- make `Output picture`

- sudo make install `Output picture`

In the make step, one can use the $-jx$ parameter where x is the number of processor to build in parallel. These steps are in accord with the installation guide on the git page itself. One can also use the cmake-gui to change some of the build configuration if need be (e.g. include OpenMP support). `Output picture` `Output picture`

2.2 Installation Test

Test the installation by calling
`make test` `Output picture`
They should all be successful.

3 CADTOPCAD

3.1 Prerequisites

- Topy

- OpenCascade

- CPPUnit:
    - sudo apt-get install lib-cppunitdev