Bavarian Graduate School of Computational Engineering
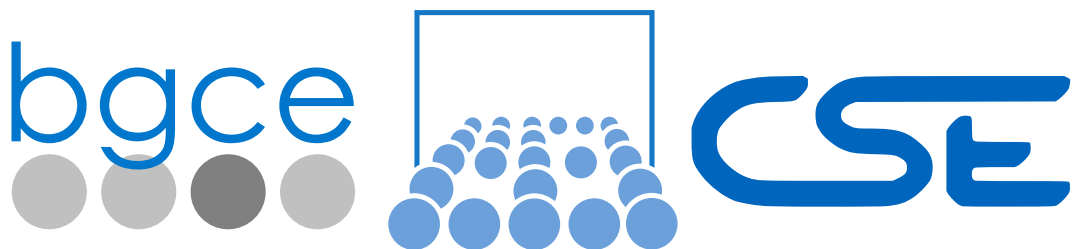
Technische Universität München

Installation Guide

CADTOPCAD-a CAD to Optimized Topology to CAD Software Tool

Authors: Saumitra Joshi,
Juan Carlos Medina,
Friedrich Menhorn,
Severin Reiz,
Benjamin Rüth,
Erik Wannerberg,
Anna Yurova

Advisors: Arash Bakhtiari (TUM),
Dirk Hartmann (Siemens AG),
Utz Wever (Siemens AG)

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

- cd 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