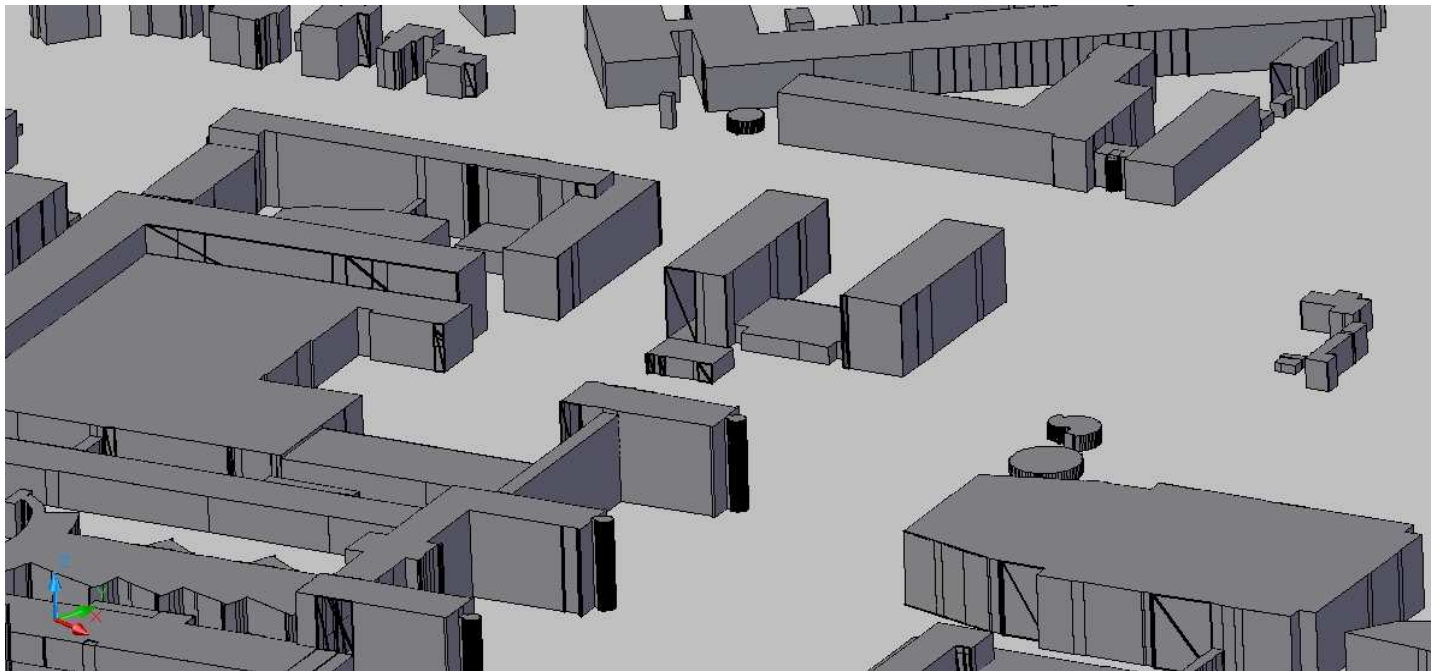


# 3D Extrusion Model of TU Delft

**3D Extrusion using programming language Java**

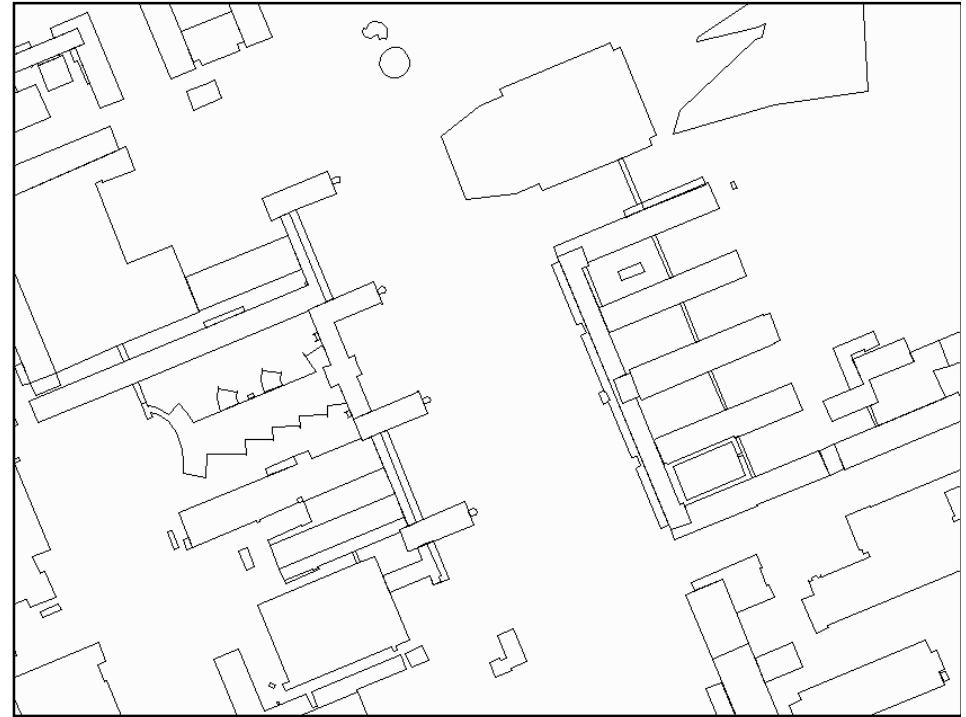
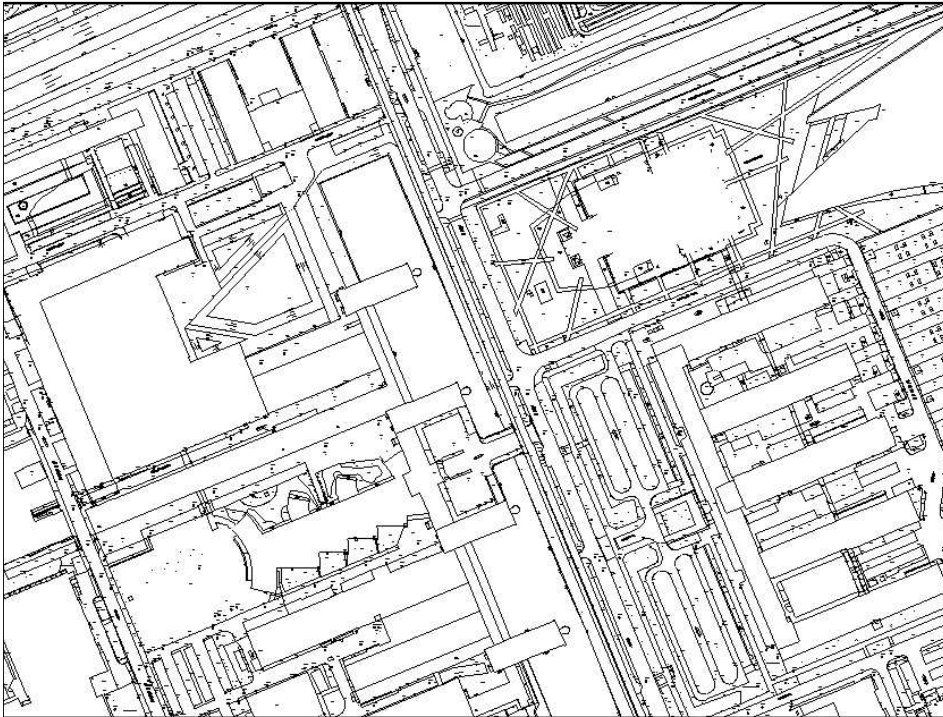
**Dave Houben**



# Input data set

Input data set from 2D dwg drawing

- Extracting buildings from the original drawing

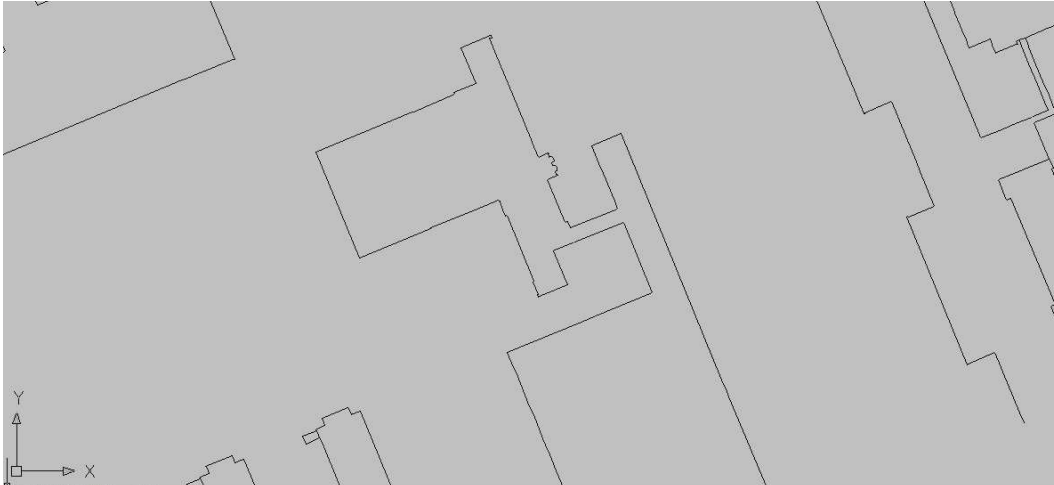


# Input data set

Input data set from 2D dwg drawing

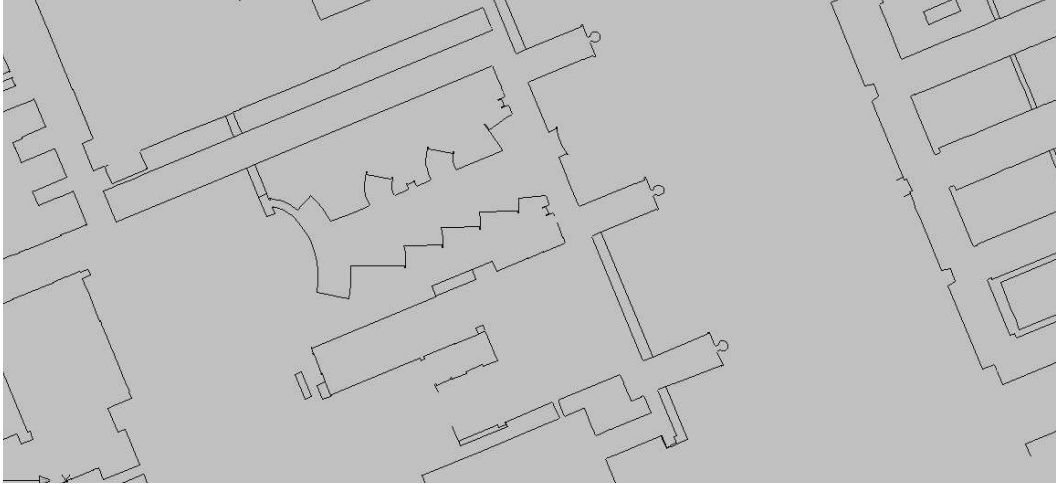
- Extracting buildings from the original drawing
- Manipulate data manually and with FME before extrusion
  - Add “missing” geometries to buildings
  - Snap lines to close areas
  - Create polygons
  - Simplify geometry
  - Delete polygon inside polygon
  - Delete unintentional polygons

# Input data set – Missing geometry

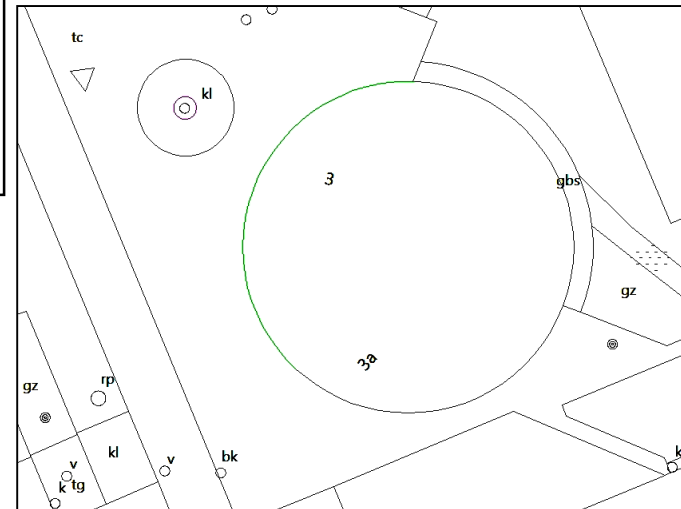
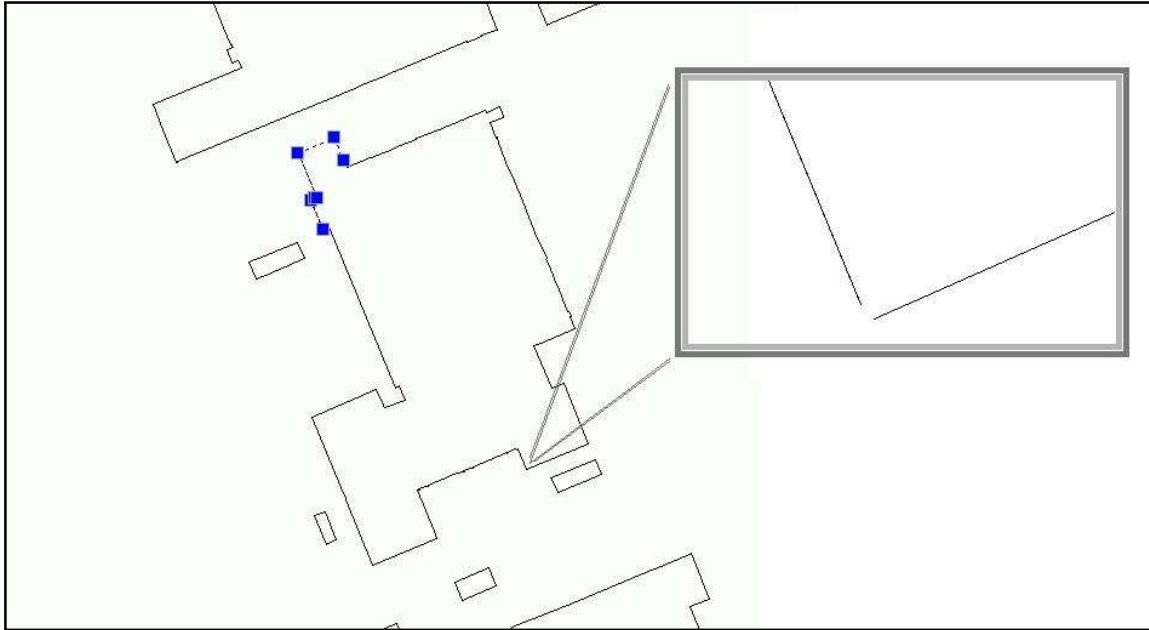




# Input data set – Missing geometry

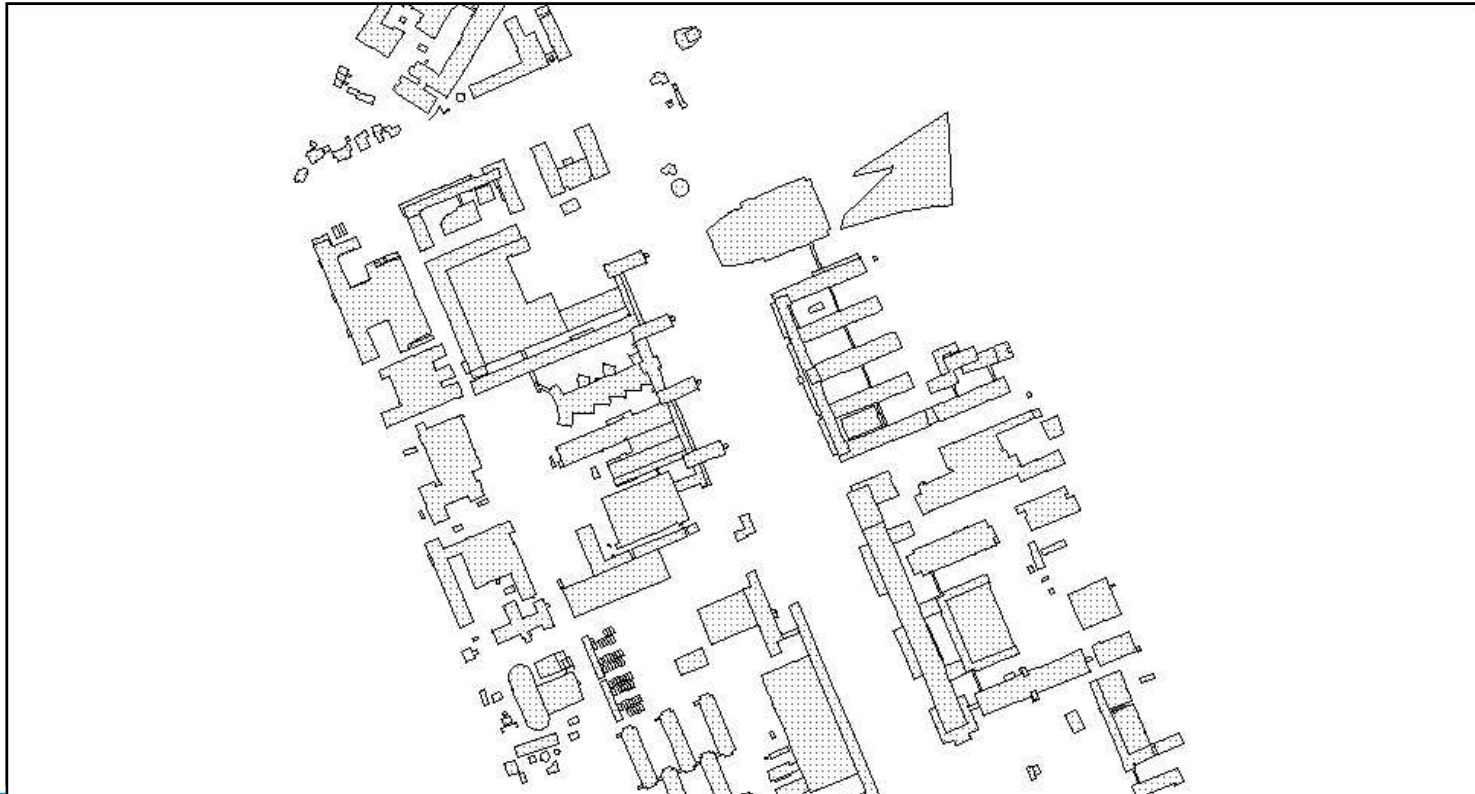


# Input data set – Cleaning up



# Point in Polygon

3D extrusion using laser elevation data and building polygons from 2D dxf drawing





# Point in Polygon





# Extrusion to Polylines

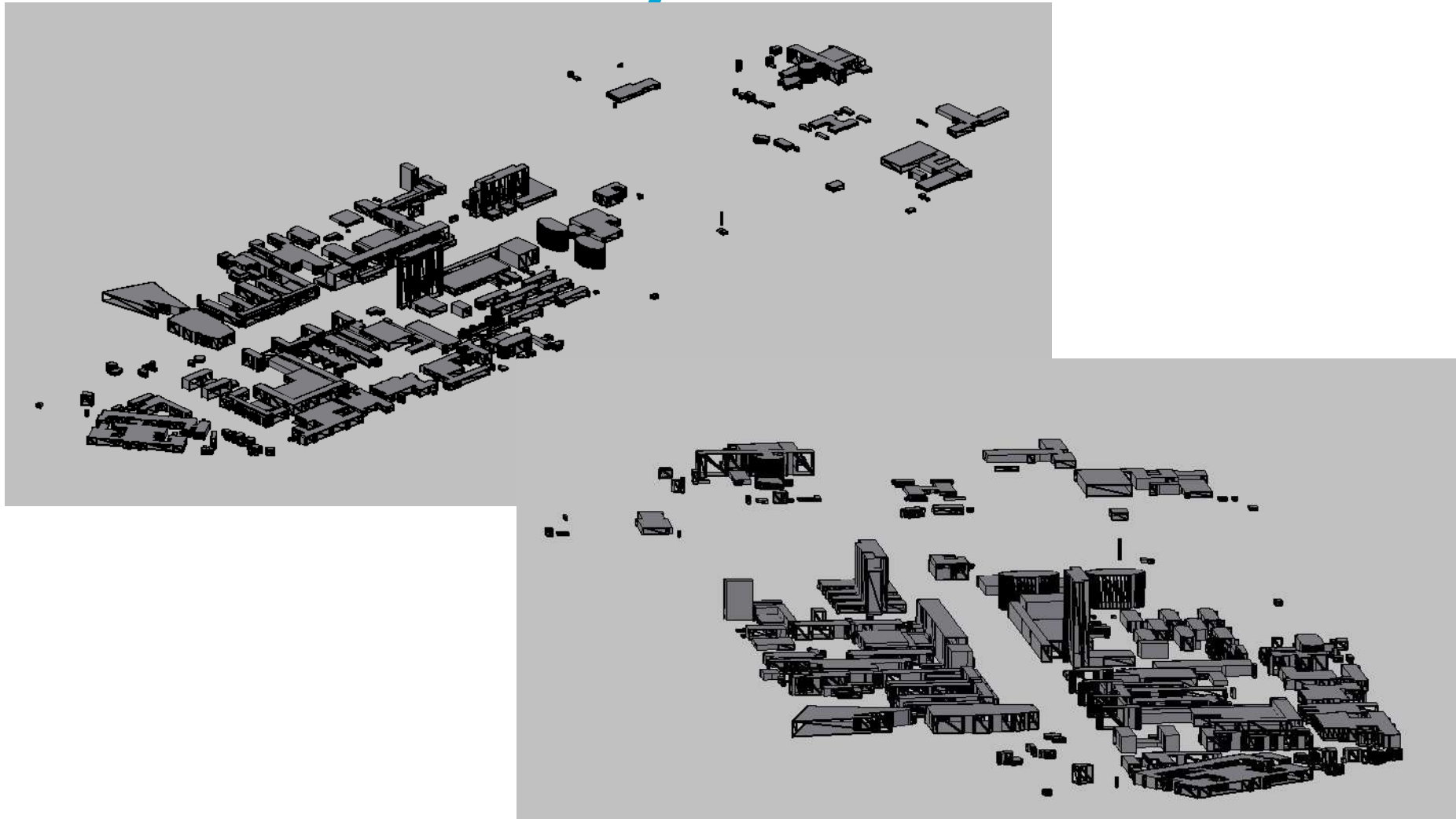
Java programming language is used to read the ascii input and create autodesk script output. The script can be read with any autodesk CAD software.

```
testfile - Notepad
File Edit Format View Help
14      11.12
85584.279      445133.062
85589.218      445121.111
85589.21       445120.815
85590.779      445121.465
85593.577      445122.623
85598.584      445124.694
85632.202      445138.604
85630.081      445143.718
85628.922      445146.52
85599.976      445216.372
85599.66       445216.608
85557.04       445198.948
85557.15       445198.701
85584.279      445133.062

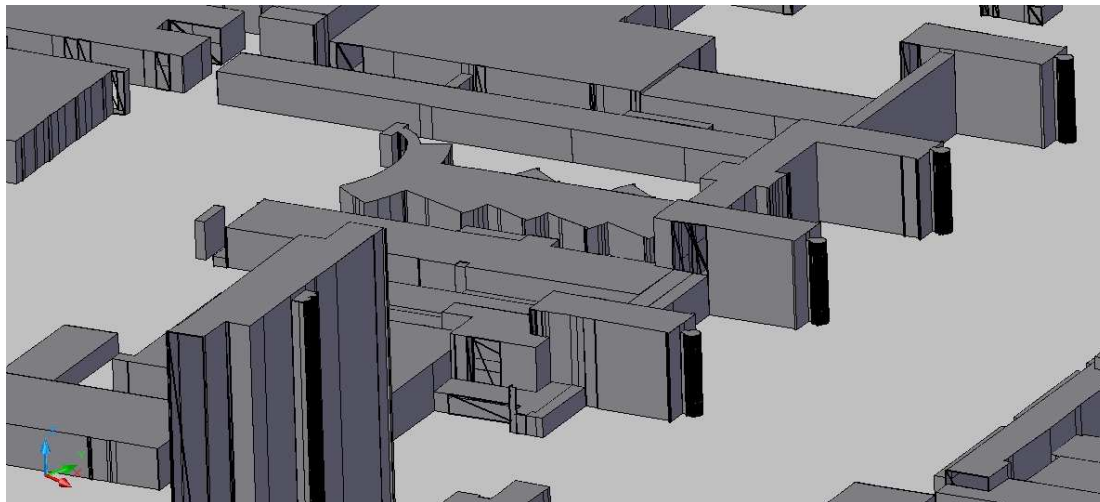
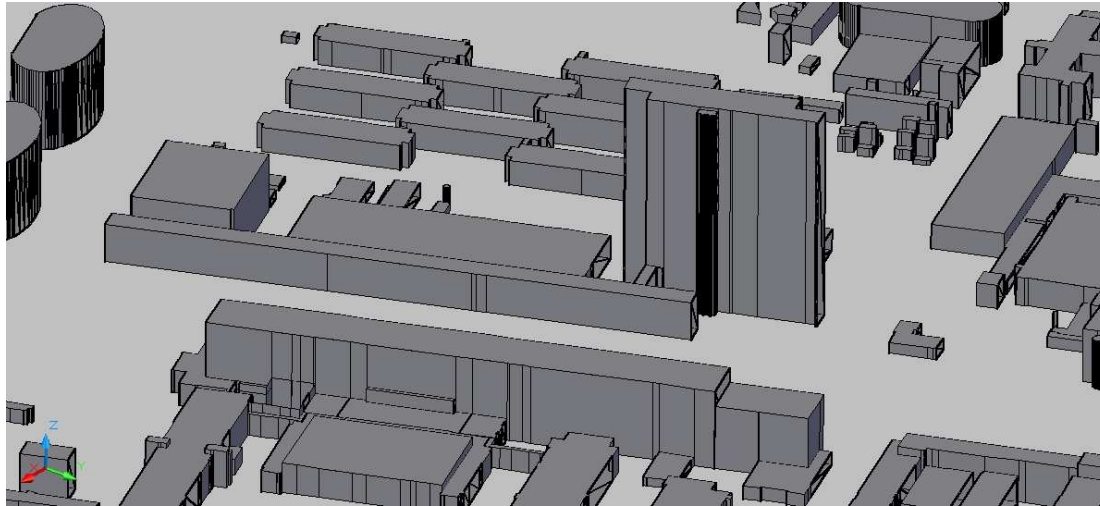
104     11.33
85072.123      446213.951
85071.623      446215.086
85071.45       446215.451
```

```
3Dfaces - Notepad
File Edit Format View Help
85233.641,446320.706,5.71
85233.641,446320.706,5.71
85234.059,446319.695,5.71
85234.653,446318.267,5.71
c
3dpoly
85244.466,446322.33,0
85244.323,446322.672,0
85244.323,446322.672,5.71
85244.466,446322.33,5.71
c
3dpoly
85244.323,446322.672,0
85244.324,446322.672,0
85244.324,446322.672,5.71
85244.323,446322.672,5.71
c
3dpoly
85244.324,446322.672,0
85244.325,446322.672,0
85244.325,446322.672,5.71
85244.324,446322.672,5.71
```

# Extrusion to Polylines



# Extrusion to Polylines

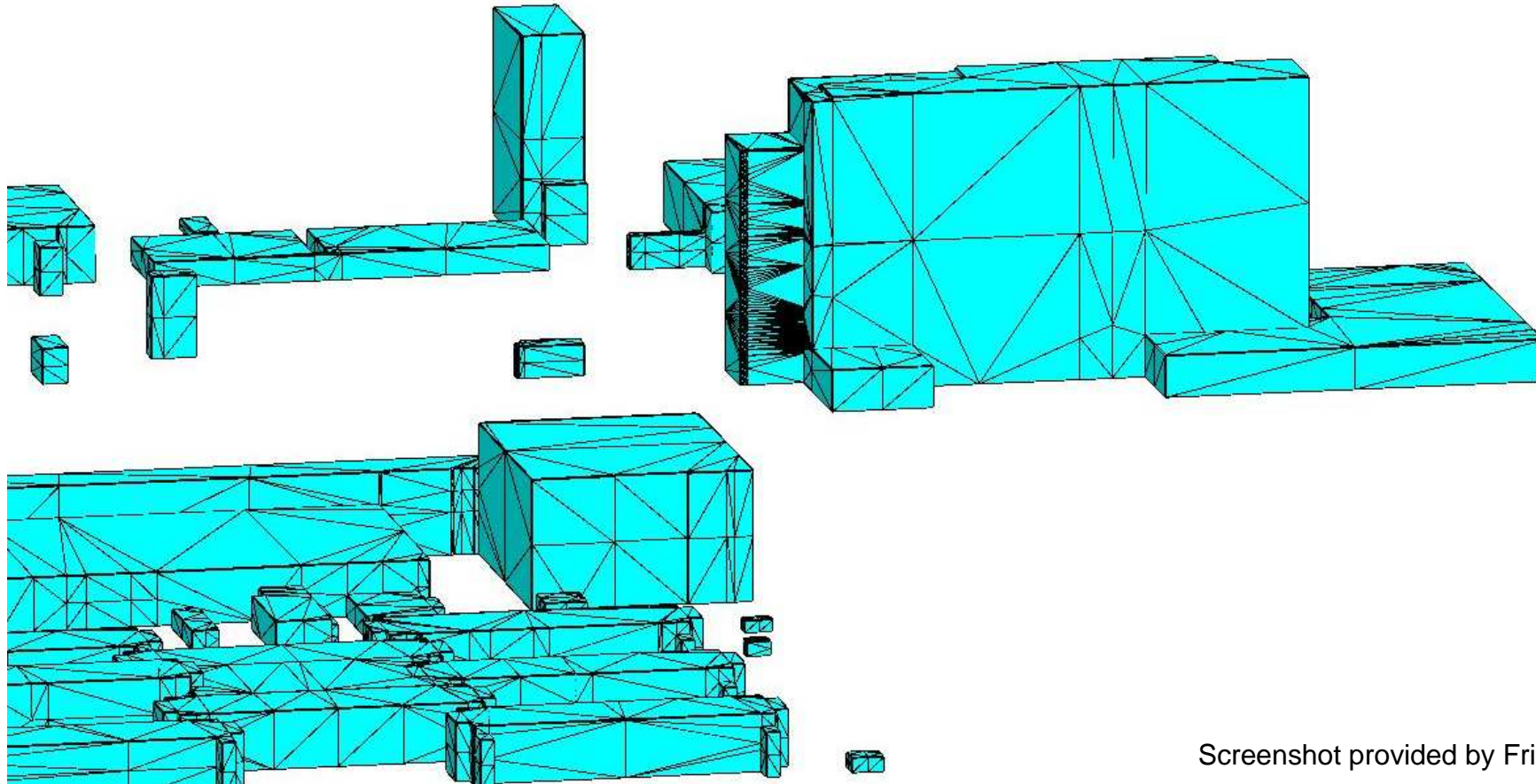




# Different data output

- *Output in autocad 3D polylines for input in database*
- Output in special format for TETGEN
  - No intersections between faces
  - No double points because of 1D surfaces
- Output in autocad 3D faces for SketchUp modelling
  - 3D faces only 3 or 4 points, therefore only walls
  - Simplify geometry for textures

# Different data output - Tetgen



Screenshot provided by Friso Penninga