CAD2X – CAD2CAD, CAD2VIS, CAD2PRINT
DATA CONVERSION FOR CAD, VISUALIZATION AND PRINT
**SUPPORTED CAD, VISUALIZATION AND 3D-PRINTING FORMATS**

<table>
<thead>
<tr>
<th>Input formats (CAD)</th>
<th>Output formats (CAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATIA V4 / V5</td>
<td>CATIA V4 / V5</td>
</tr>
<tr>
<td>SolidWorks</td>
<td>STEP</td>
</tr>
<tr>
<td>Parasolid</td>
<td>IGES</td>
</tr>
<tr>
<td>Siemens NX</td>
<td>VDA-FS</td>
</tr>
<tr>
<td>PTC Creo</td>
<td>3D PDF</td>
</tr>
<tr>
<td>JT</td>
<td></td>
</tr>
<tr>
<td>STEP</td>
<td></td>
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<tr>
<td>Inventor</td>
<td></td>
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<tr>
<td>IGES</td>
<td></td>
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<tr>
<td>VDA-FS</td>
<td></td>
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</table>

**CAD2CAD**

<table>
<thead>
<tr>
<th>Output formats (visualization, tessellated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X3D</td>
</tr>
<tr>
<td>OBJ</td>
</tr>
<tr>
<td>VRML 2.0</td>
</tr>
</tbody>
</table>

**CAD2Vis**

<table>
<thead>
<tr>
<th>CAD2Print</th>
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</thead>
<tbody>
<tr>
<td>STL</td>
</tr>
<tr>
<td>3MF</td>
</tr>
</tbody>
</table>
USER-DEFINED TESSELATION (1/2)

- Tuned default settings of tessellation parameters
- User-definable tessellation parameters

propeller with default tessellation parameters

reduced number of triangles (feature-aware)
USER-DEFINED TESSELLATION (2/2)

- User-definable tessellation parameters, e.g. normal and surface tolerances

Surface normal tolerance to create less triangles
Narrow region repair option to control the surface tolerance
Extend surface grid to edges
GAPLESS TESSELLATION

- Tolerances in CAD model may yield gaps in the tessellation
- CAD2X provides the possibility to close gaps while tessellating
CAD models may contain arbitrarily oriented normals.

CAD2X provides the possibility to consistently orient normals (healing).
DATA CONVERSION FOR CAD, VISUALIZATION AND 3D-PRINTING

CAD2X: two versions

- library to be integrated into ISV applications
  - load, (re-)tessellate, save, ...
- stand-alone application (executable) for end users (CAD2View)

- source CAD system is not required
- CATIA supported natively as input file format

- trimmed NURBS can be exported to visualization systems, e.g. as a basis for ray tracing the original NURBS geometry
EXAMPLE MODELS

Input formats (CAD)
- CATIA V4 / V5
- SolidWorks
- Parasolid
- Siemens NX
- PTC Creo
- JT
- STEP
- Inventor
- IGES
- VDA-FS

CAD2Vis
EXAMPLE MODEL (CAD2PRINT)

Input formats (CAD)
- CATIA V4 / V5
- SolidWorks
- Parasolid
- Siemens NX
- PTC Creo
- JT
- STEP
- Inventor
- IGES
- VDA-FS

CAD2Print

STEP

3MF

3rd party 3MF viewer
Desktop application to
- load,
- view,
- re-tessellate,
- convert and
- export

CAD files
ADDITIOnAL OPTIONS (1/2)

- Metadata extraction
  - Material information
  - PMI

- Extraction of topological entities
  - Faces
  - Edges
  - Vertices

Material properties extracted from CAD file
**ADDITIONAL OPTIONS (2/2)**

- Integration with Instant3Dhub
  - parallel conversion of files in a multi-file assembly structure
  - accelerated transcoding process

<table>
<thead>
<tr>
<th># files</th>
<th># triangles</th>
<th># assemblies</th>
<th># parts</th>
<th>volume</th>
<th>Transcoding time</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>serial</td>
</tr>
<tr>
<td>1.808</td>
<td>1,645.387</td>
<td>219</td>
<td>1.231</td>
<td>377 MByte</td>
<td>41 min 52 s</td>
</tr>
</tbody>
</table>

- [https://www.threedy.io/](https://www.threedy.io/)
CAD2X – DATA CONVERSION FOR CAD, VISUALIZATION AND 3D-PRINTING

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