A CAD Toolkit Patch for ESP-r

Abstract

Gtool, a productivity toolkit for esp-r, lets you build CAD models, manipulate it in 3D colour rendered, create esp-r zones and connections and make esp-r simulations fast, interesting and fun. This document describes how to patch it to esp-r and use it on Ubuntu Linux.

1 Pre-requisite

Esp-r is installed and fully functional[1].

2 Apply the CAD Toolkit patch

The CAD Toolkit patch is distributed as Linux installers. Once obtained they can be installed using the following commands:

```
sudo ./esp-r-cad-patch-i686-built-ddmmyy.bin (for 32-bit system)
sudo ./esp-r-cad-patch-x86_64-built-ddmmyy.bin (for 64-bit system)
sudo ./esp-r-cad-patch-uninstall-ddmmyy.bin (to safely remove the patch)
```

3 Modify environment variables

Add the following lines to your .profile, assuming the PATH variable to run esp-r is correctly set:

```
export ESPRHOME="/usr/esru/esp-r"  (change if in different path)
export XAPPLRESDIR="$ESPRHOME/app-defaults"
```

Use the Linux `ldconfig` facility to configure your Dynamic Linker Run Time Bindings, making it pointing to `$ESPRHOME/lib`.

If you use the LD_LIBRARY_PATH variable make sure it is fully functional[2].

[1] https://www.strath.ac.uk/research/energysystemsresearchunit/applications/esp-r/

[2] Ubuntu disabled some functions of LD_LIBRARY_PATH on security ground.

4 Using the CAD Toolkit

Type the command ***gtool*** in an Ubuntu Terminal starts the CAD Toolkit program. Figure 1.

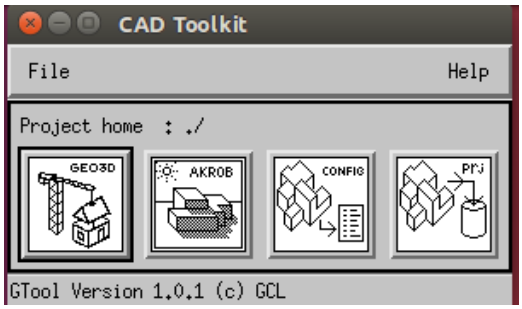

Figure 1 gtool top level window

Two exemplars are installed in the folder `$HOME/samples/esp-r`. The handshaking between the CAD Toolkit and esp-r is demonstrated here using the project `i-model`:

1. Create a new esp-r project
   a) Click the fourth button to start ***prj***. Create a new esp-r project, name it as `i-model`;
   b) Create four dummy zones and name them `i-model_01, i-model_02, ..., i-model_04`.
   c) Save the project and exit ***prj***.

2. Create your CAD model
   a) Click 'File -> Set project home' and navigate **into** the esp-r project folder, `i-model`;
   b) Click the first button to start the CAD app;
   c) Create a building with four zones. The building may be any form and shape. Naming for zones is optional. Save the model with the name `i-model.vef`, Figure 2.

3. View the model in 3D colour rendered in solid form
   a) Click the second button to start the app ***akrobat***;
   b) Click 'File -> Open' to open the CAD model.

4. Handshaking with esp-r
   a) Click the third button to start the app ***config***;
   b) Click 'File -> Open CAD model' to load the CAD model, `i-model.vef`;
   c) Click 'View -> show CAD' to display the CAD model in solid form;
   d) Click 'File -> Make esp-r Zones' to generate esp-r type zones and connections;
   e) Click 'File -> Update esp-r Project' to update the esp-r project with the new zones that have been created using the CAD app;
   f) Click 'File -> Convert CAD to Plan' if you want to save the model in VEW format for colour rendering using ***akrobat*** or displaying using esp-r's viewer.

5. Continue with your esp-r project
   a) Click the fourth button to start ***prj***.
   b) Click 'open existing -> other', enter `i-model`; The CAD model is displayed, Figure 3;
   c) Continue working with your esp-r project as usual …

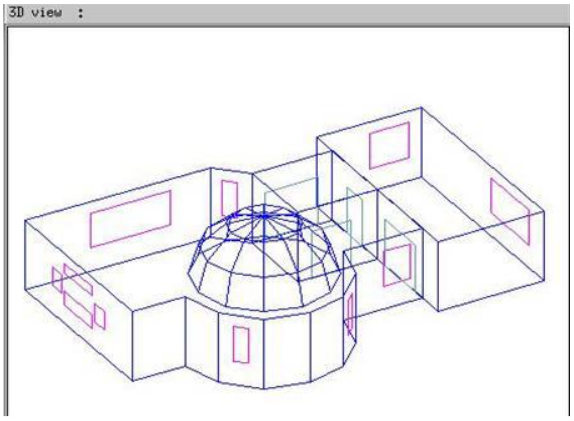

Figure 2 The CAD building model

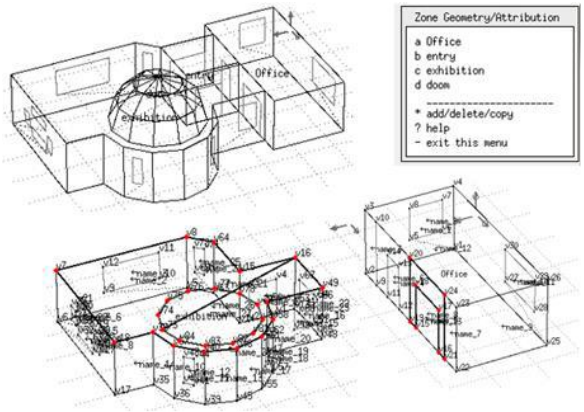

Figure 3 The CAD model in esp-r

5 Issues and tips

- The second exemplar, `i-home`, is a detached home with 16 zones, Figure 4. I added a few touches to the PLAn model making it interesting to look and fun to work with, Figure 5.

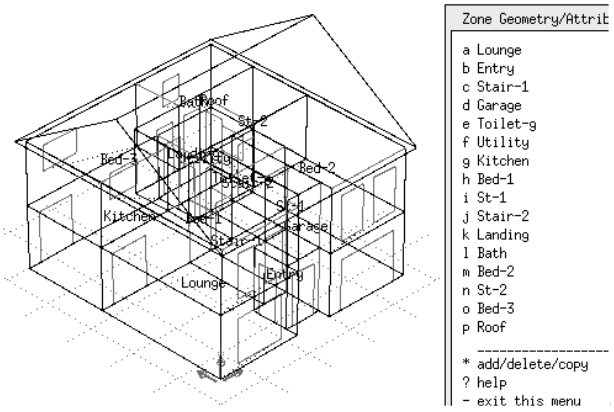

Figure 4 The CAD building model in esp-r

Figure 5 The building model colour rendered

- When generating zones from the CAD model, some surfaces in one zone are split up to match the outlines of the neighbouring zones. This causes warnings of 'enclosure bounding' in esp-r. However these warnings are benign to esp-r simulations[3].

6 Copyright

The CAD Toolkit patch is a test version free to use under NDA available upon request. Anyone who interested is welcome to request a personal copy by completing and signing the NDA next page and email it to the distributor at visualsimu@gmail.com

[3] The surfaces that causing warnings already had the essential sets of vertices for polygon calculations.

GLOBATNET CONSULTING LIMITED (GCL)
Non-Disclosure Agreement (NDA)
for the
CAD TOOLKIT BETA-TESTING EDITION, VERSION 1.0.1_X

GLOBATNET CONSULTING LIMITED (GCL) IS WILLING TO LICENSE THE SOFTWARE IDENTIFIED ABOVE TO YOU ONLY UPON THE CONDITION THAT YOU ACCEPT ALL OF THE TERMS CONTAINED IN THIS NON-DISCLOSURE AGREEMENT (NDA). PLEASE READ THE NDA CAREFULLY. BY INSTALLING THIS SOFTWARE, YOU ACCEPT THE TERMS OF THE NDA. IF YOU ARE NOT WILLING TO BE BOUND BY ALL THE TERMS, PLEASE STOP INSTALLING THIS SOFTWARE.

1. We, GCL, the Discloser intend to disclose information (CAD Toolkit beta-testing edition) to You, the Recipient, for the purpose of testing and using of the software (the Purpose).

2. The Recipient undertakes not to use the Confidential Information for any purpose except the Purpose, without first obtaining the written agreement of the Discloser.

3. The Recipient undertakes to keep the Confidential Information secure and not to disclose and/or redistribute it to any third party except for testing and using the software. The Recipient may claim ownership and IPR for the results he/she obtained from using the software.

4. The undertakings in clauses 2 and 3 above apply to all of the information disclosed by the Discloser to the Recipient, regardless of the way or form in which it is disclosed or recorded but they do not apply to:

a) any information which is or in future comes into the public domain (unless as a result of the breach of this Agreement); or

b) any information which is already known to the Recipient and which was not subject to any obligation of confidence before it was disclosed to the Recipient by the Discloser.

5. Nothing in this Agreement will prevent the Recipient from making any disclosure of the Confidential Information required by law or by any competent authority.

6. Neither this Agreement nor the supply of any information grants the Recipient any licence, interest or right in respect of any intellectual property rights of the Discloser except the right to copy the Confidential Information solely for the Purpose.

7. This Agreement is governed by, and is to be construed in accordance with, English law. The English Courts will have non-exclusive jurisdiction to deal with any dispute which has arisen or may arise out of, or in connection with, this Agreement.

Name (capital): _____

Organisation: _____

Signature: _____

Date: _____