ECAD Viewer Development and Integration Insights: A Journey Through the Open Source Community

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Talk outline

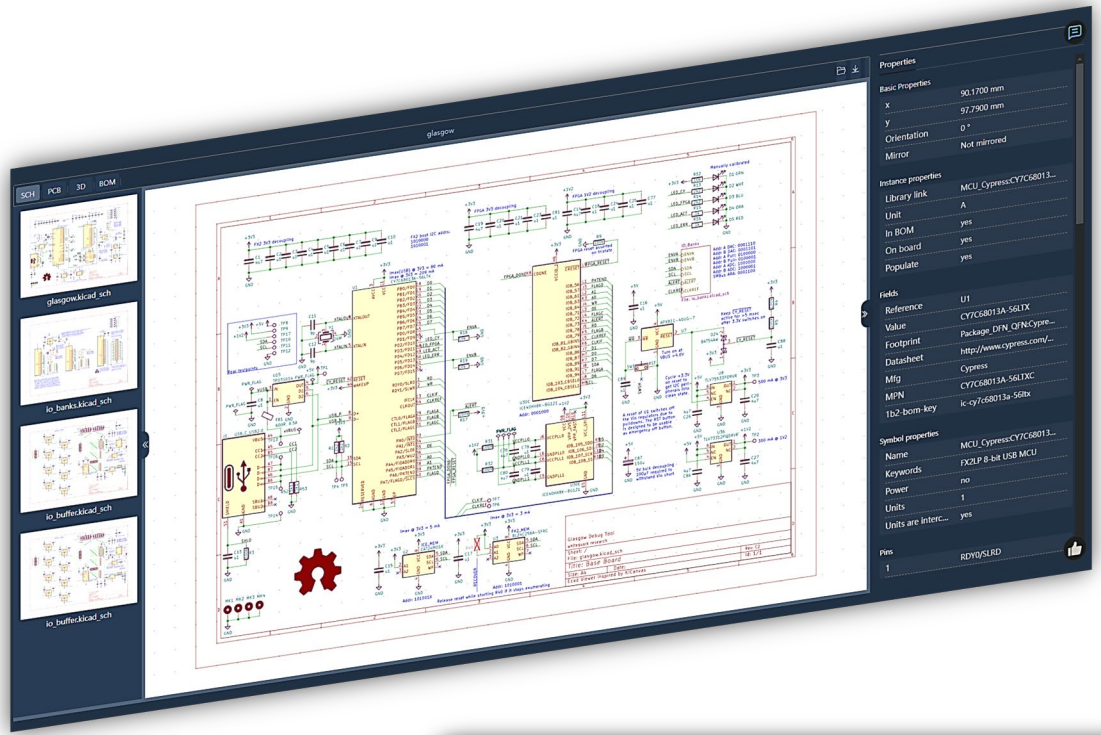
Give ECAD-Viewer a Try:

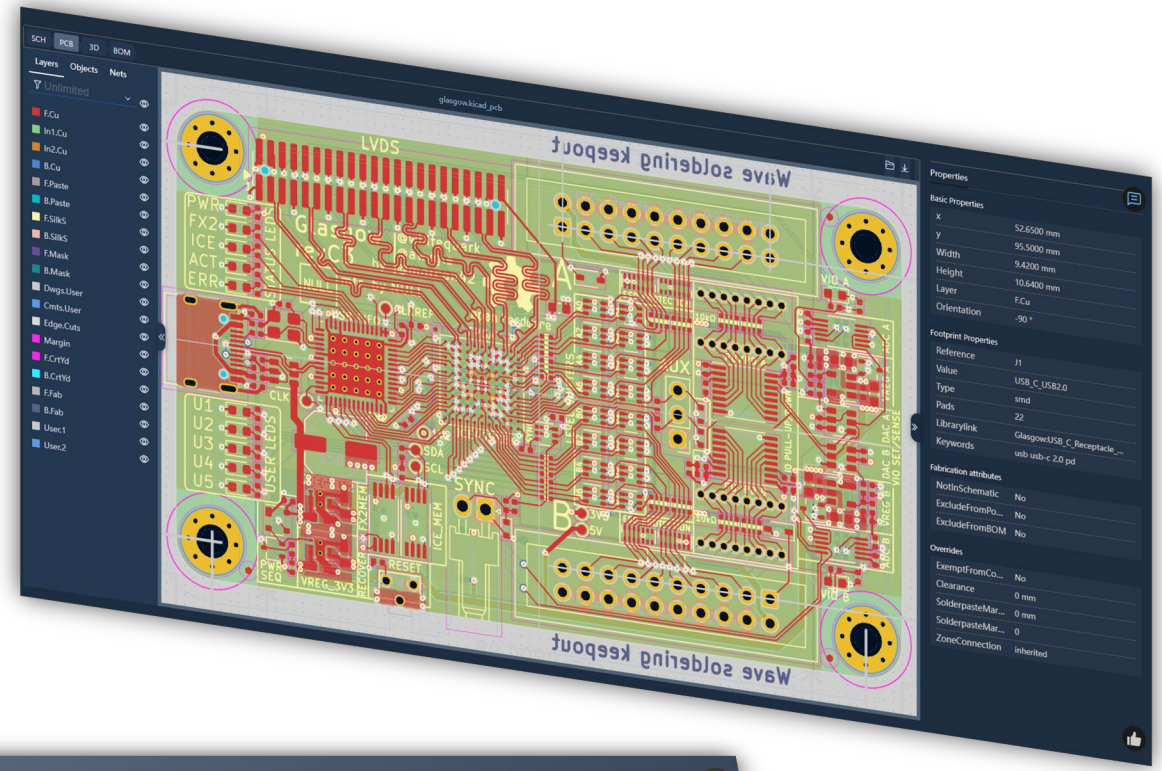
- Online Design Viewer
- AI-Powered Design Interaction
- Roadmap

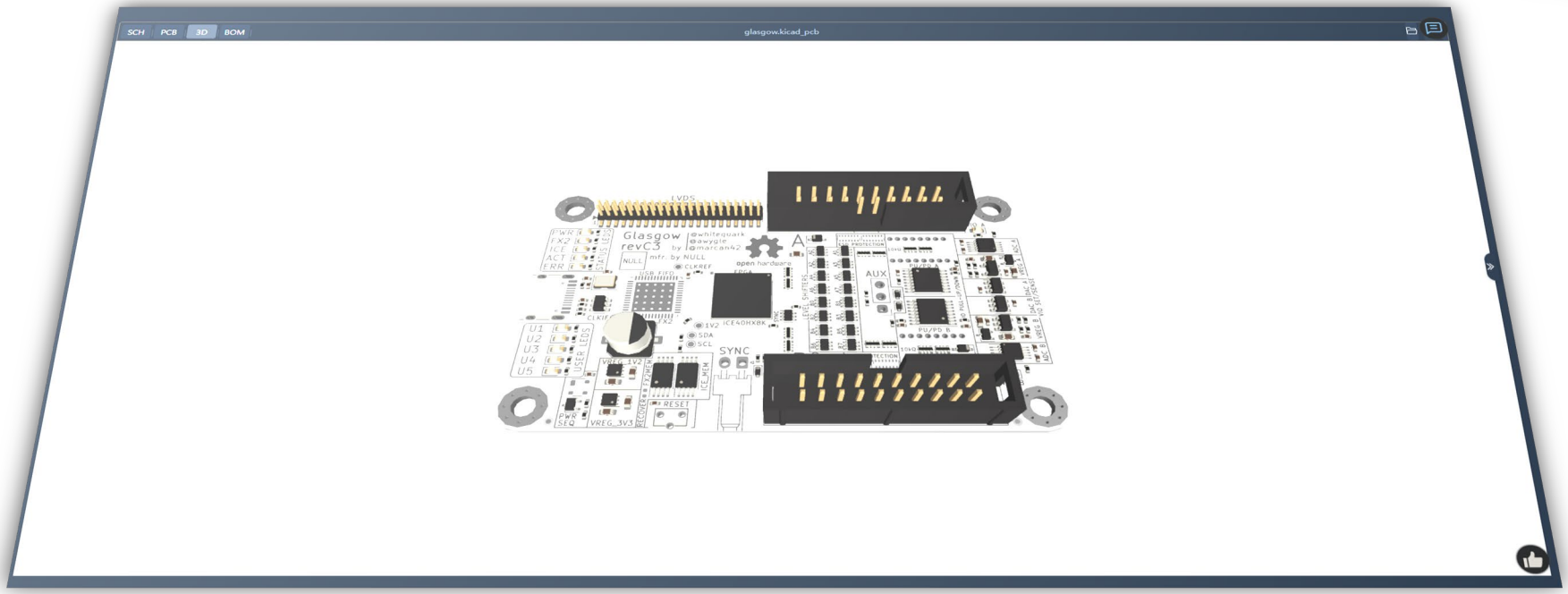
Integration and Development

- Architecture of ECAD-Viewer
- Integrating ECAD-Viewer To Your Website
- Development Stories with the Open Source Community

How to Share Designs for Documentation and Review


glasgow
SCH
PCB
3D
BOM
glasgow.kicad_sch
io_banks.kicad_sch
io_buffer.kicad_sch
io_buffer.kicad_sch
Properties
Basic Properties
x 90.1700 mm
y 97.7900 mm
Orientation 0 °
Mirror Not mirrored
Instance properties
Library link MCU_Cypress:CY7C68013...
Unit A
In BOM yes
On board yes
Populate yes
Fields
Reference U1
Value CY7C68013A-56LTX
Footprint Package_DFN_QFN:Cypre...
Datasheet http://www.cypress.com/...
Mfg Cypress
MPN CY7C68013A-56LTXC
tb2-bom-key ic-cy7c68013a-56ltx
Symbol properties
Name MCU_Cypress:CY7C68013...
Keywords FX2LP 8-bit USB MCU
Power no
Units 1
Units are Interc... yes
Pins
1 RDY0/SLRD

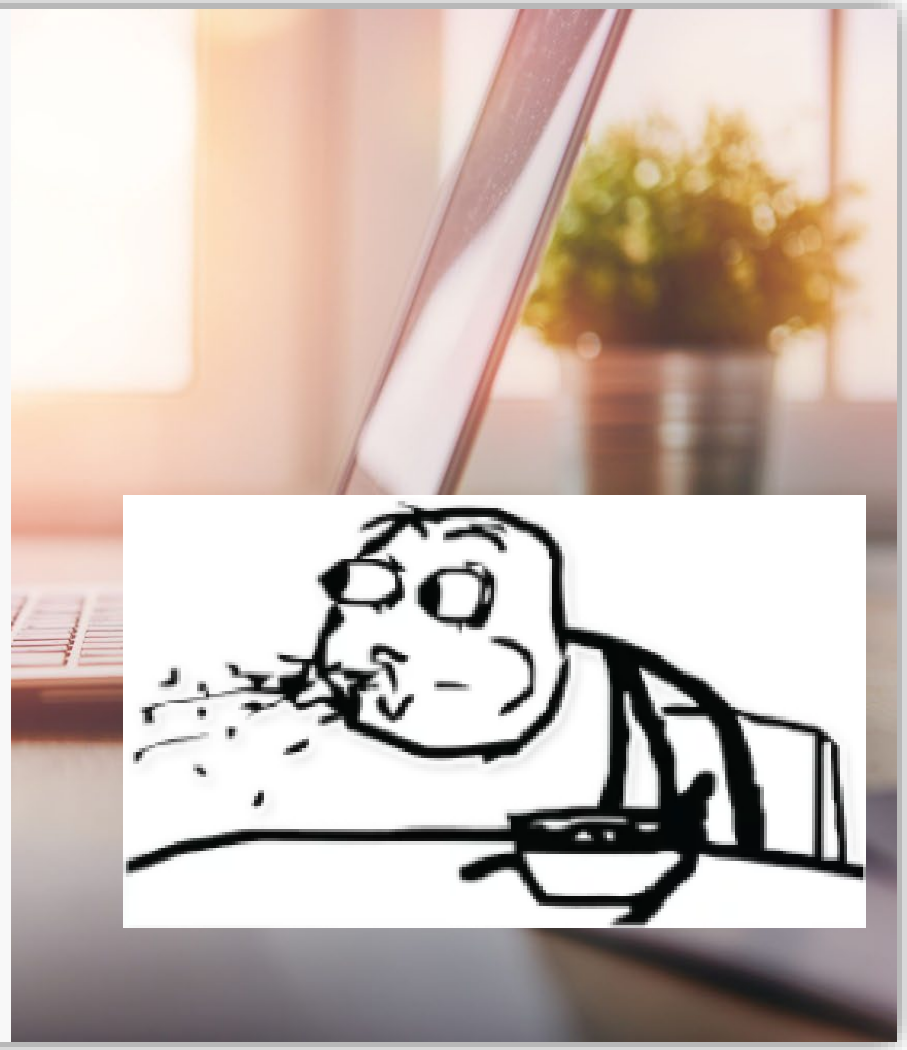

SCH
PCB
3D
BOM
Layers
Objects
Nets
Unlimited
F.Cu
In1.Cu
In2.Cu
B.Cu
F.Paste
B.Paste
F.SilkS
B.SilkS
F.Mask
B.Mask
Dwgs.User
Cmts.User
Edge.Cuts
Margin
F.CrtYd
B.CrtYd
F.Fab
B.Fab
User.1
User.2
glasgow.kicad_pcb
LVDS
Wave soldering keepout
PWR
FX2
ICE
ACT
ERR
Glasgow
revC3
AUX
SYNC
RESET
VREG_3V3
Properties
Basic Properties
x 52.6500 mm
y 95.5000 mm
Width 9.4200 mm
Height 10.6400 mm
Layer F.Cu
Orientation -90 °
Footprint Properties
Reference J1
Value USB_C_USB2.0
Type smd
Pads 22
Librarylink Glasgow:USB_C_Receptacle_...
Keywords usb usb-c 2.0 pd
Fabrication attributes
NotInSchematic No
ExcludeFromPo... No
ExcludeFromBOM No
Overrides
ExemptFromCo... No
Clearance 0 mm
SolderpasteMar... 0 mm
SolderpasteMar... 0
ZoneConnection inherited


SCH
PCB
3D
BOM
glasgow.kicad_pcb
LVDS
Glasgow
revC3
AUX
SYNC
RESET
VREG_3V3

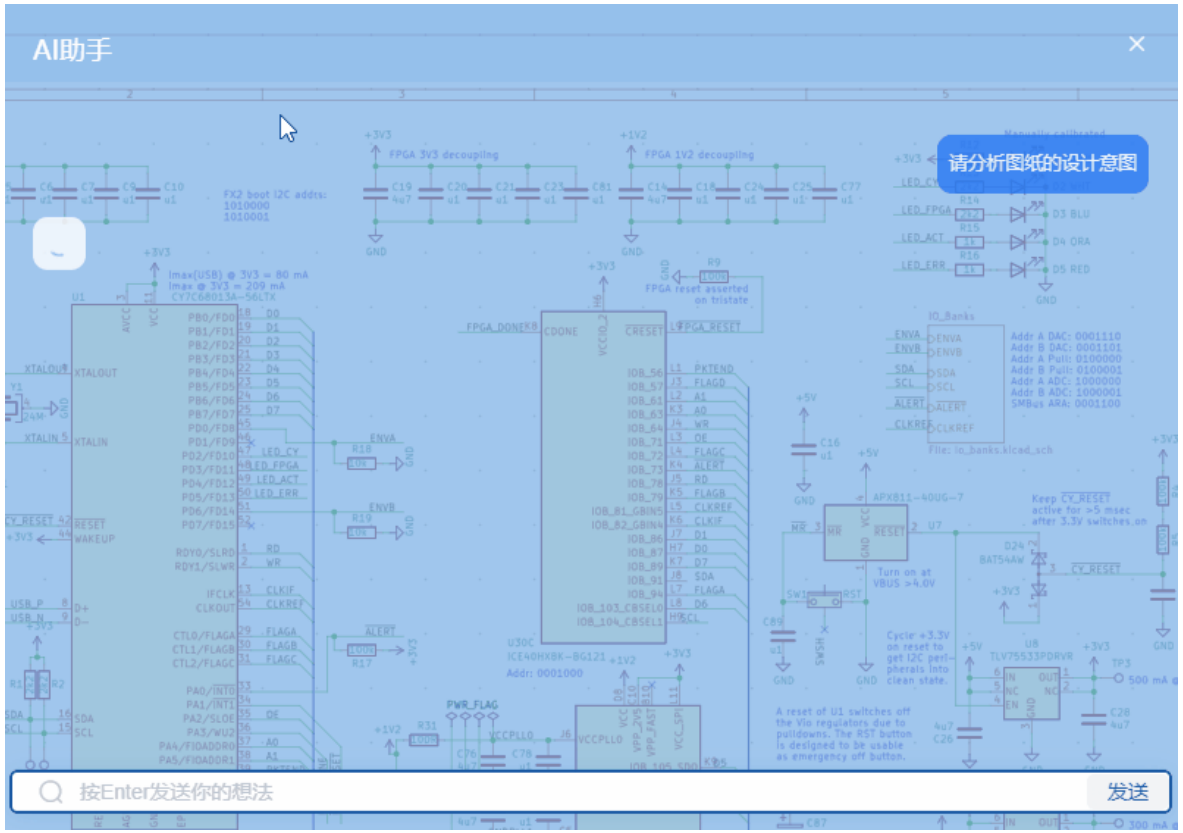
No One Is Experienced at the Beginning

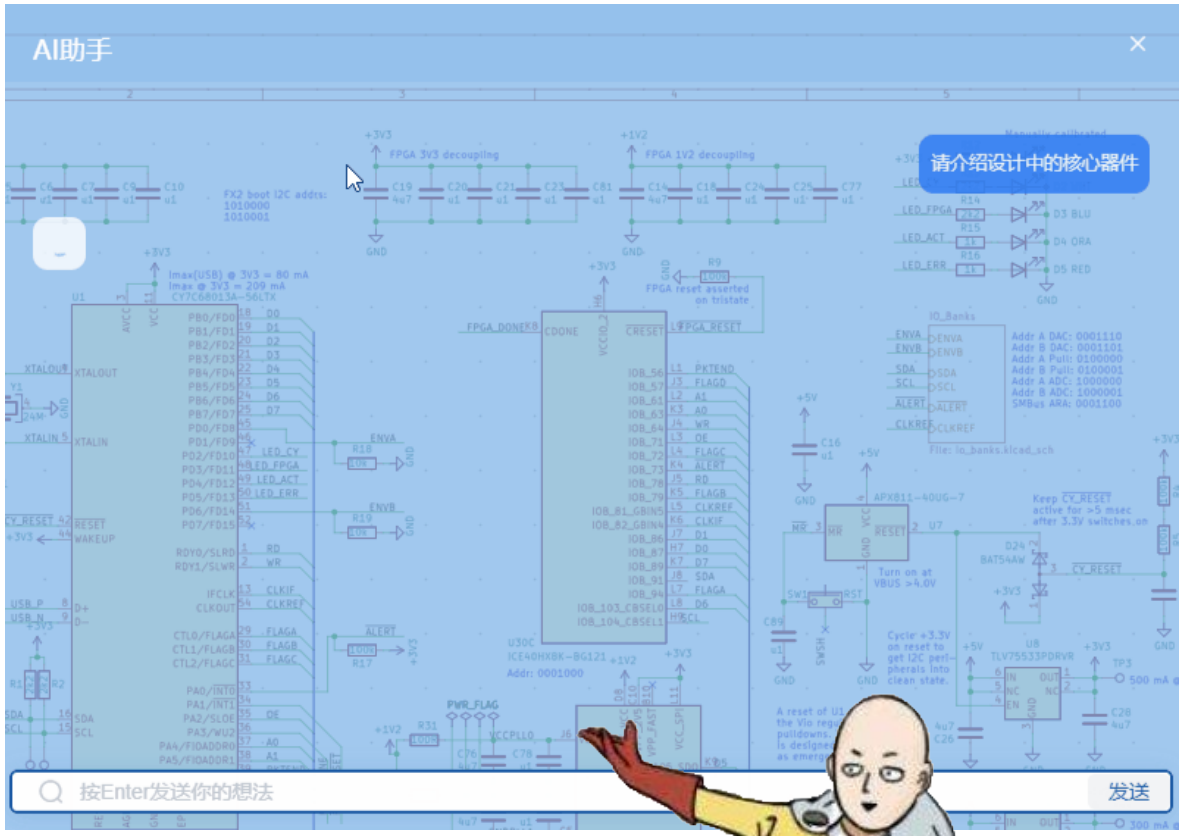
When you take over a legacy project

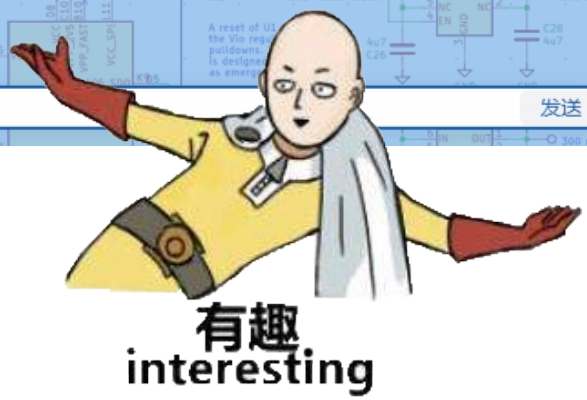
```
➜StepperServo tree /F /A
Folder PATH listing
Volume serial number is F4CA-6751
C:.
+---Design
|   |   low_pass.py
|   |
|   \---Magnet
|           MotorMagnetPlanar.ans
|           MotorMagnetPlanar.fem
|
\---PCB
    |   fp-lib-table
    |   StepperServoCAN.kicad_pcb
    |   StepperServoCAN.kicad_pro
    |   StepperServoCAN.kicad_sch
    |   sym-lib-table
    |
    +---Connector_JST
    |   |   Connector_JST.dcm
    |   |   Connector_JST.lib
    |   |
    |   +---Connector_JST.models
    |   |       S4B-XH-SM4-TB.step
    |   |
    |   \---Connector_JST.pretty
    |           JST-S4B-XH-SM4-TB.kicad_mod
    |
    \---TLE5012
        |   TLE5012.dcm
        |   TLE5012.lib
        |
        +---TLE5012.footprints
        |       Infineon-TLE5012-Level_A.kicad_mod
        |       Infineon-TLE5012-Level_B.kicad_mod
        |       Infineon-TLE5012-Level_C.kicad_mod
        |
        \---TLE5012.models
                SOIC127P600X175-8N.step
```



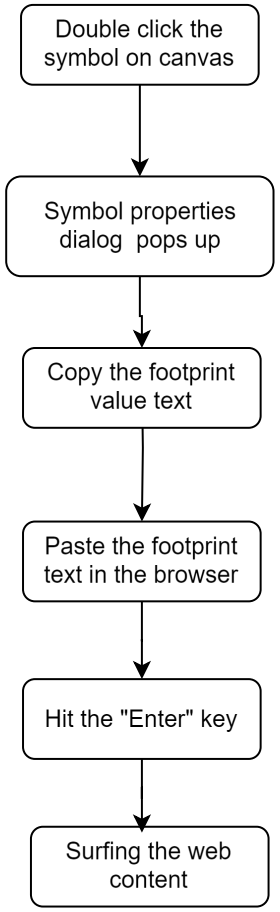
AI Saves Your Hair: Master Designs, Skip the Hassle



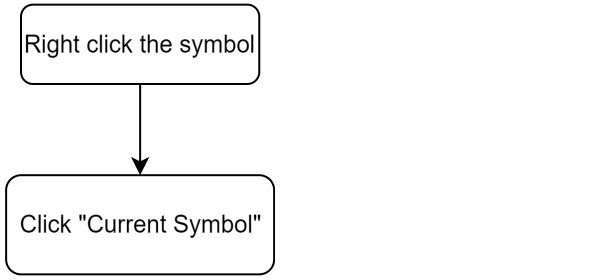


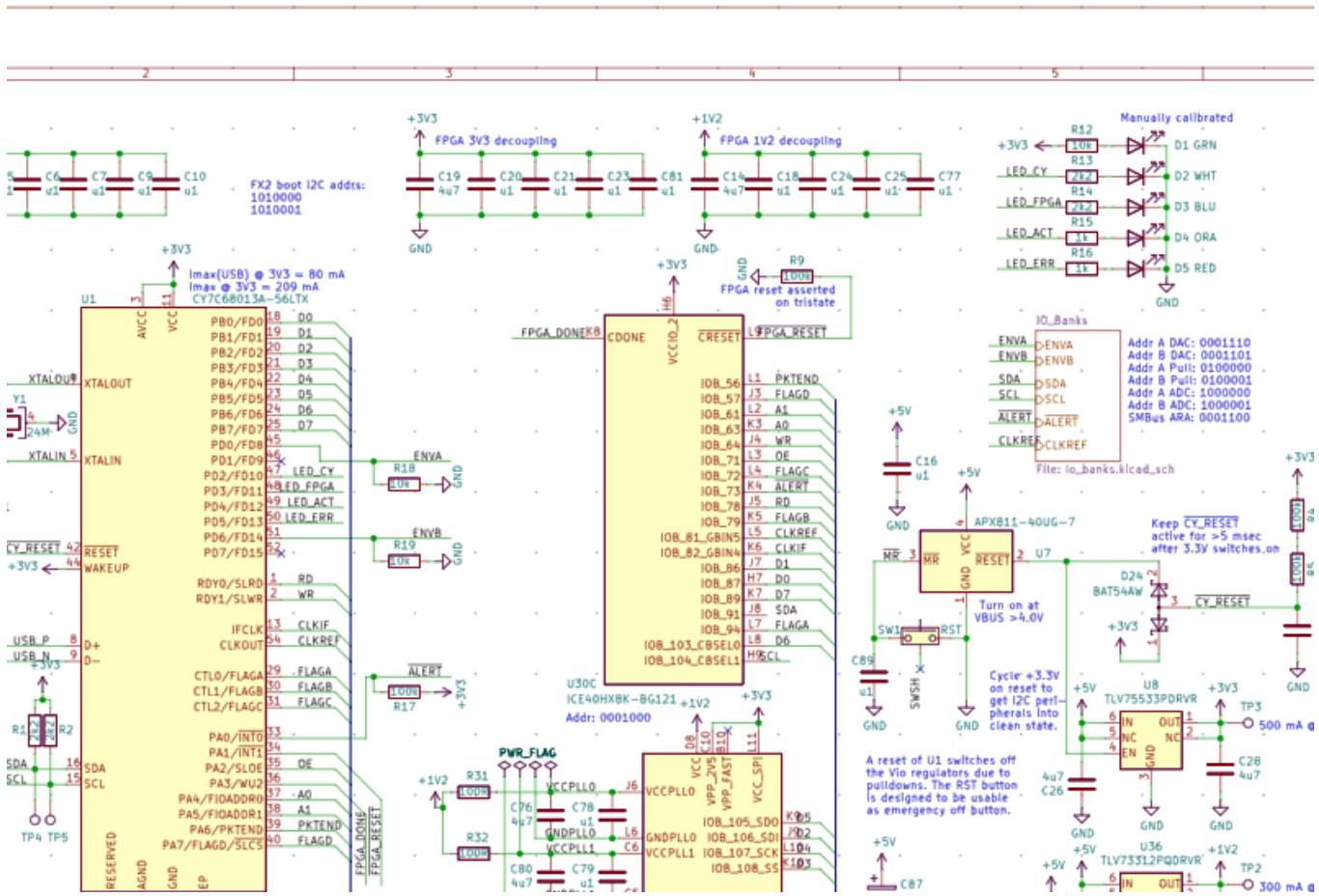


Steps to Find Specifications for a Symbol



Steps to Find Specifications for a Symbol with AI



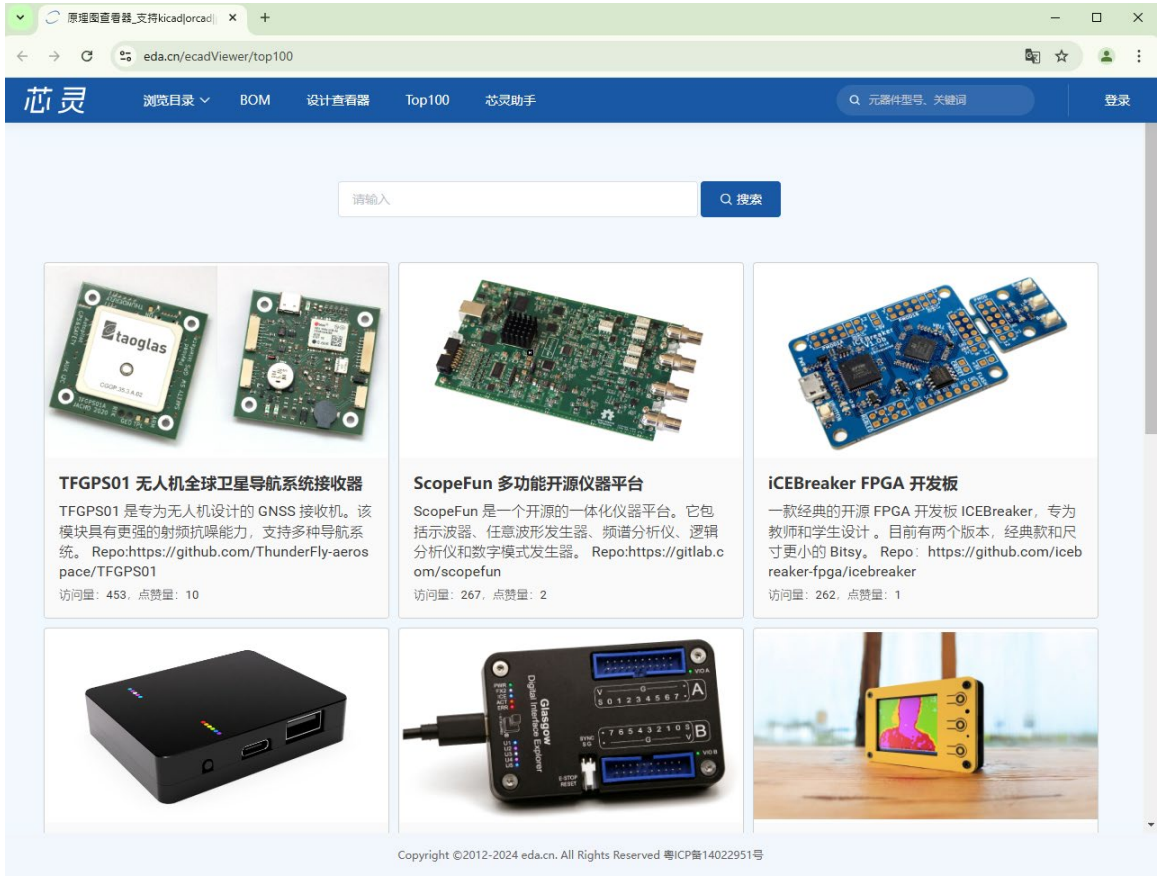


Ways to Explore ECAD-Viewer

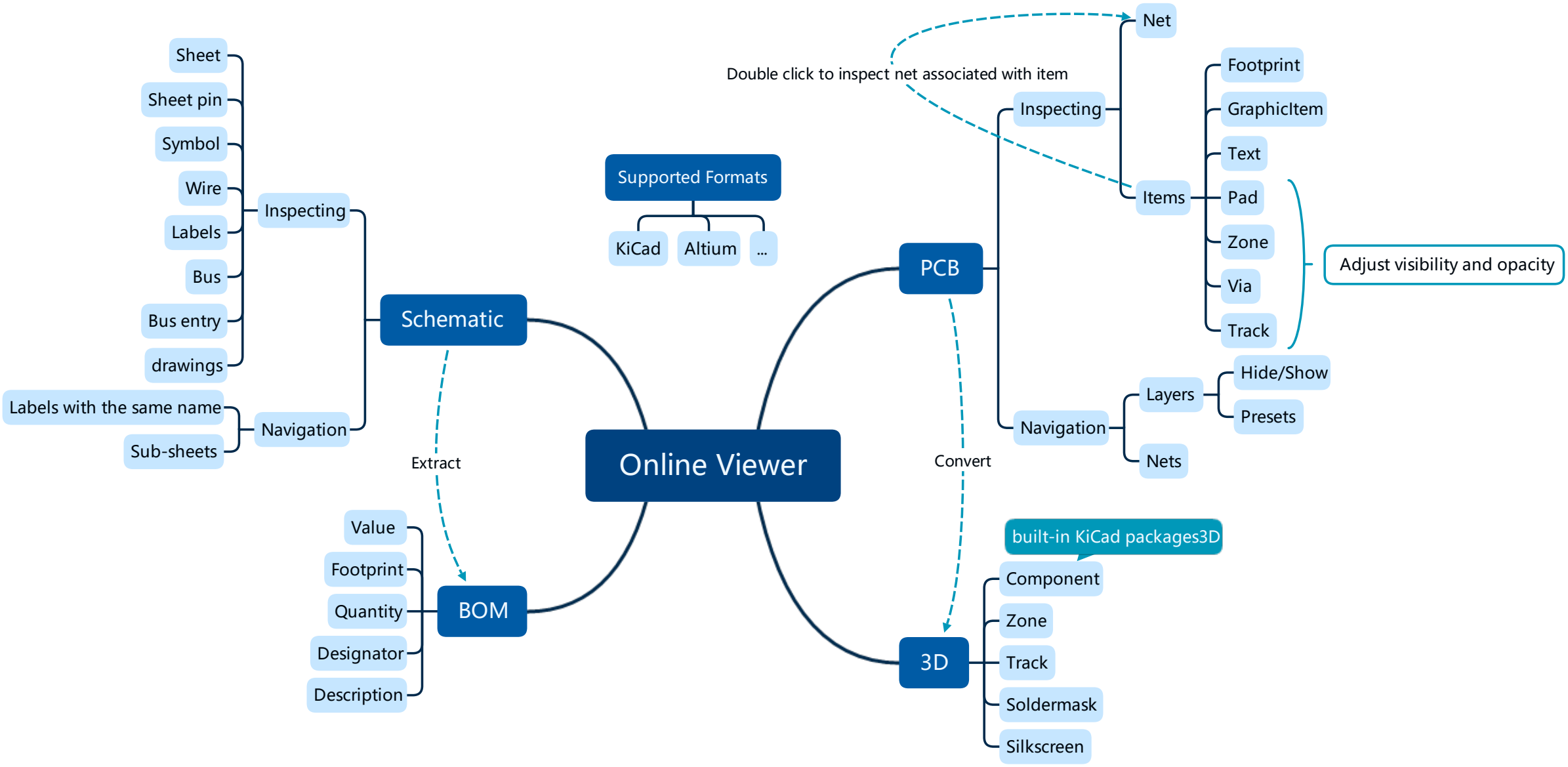
Upload and view your own designs directly in the design viewer

https://www.eda.cn/ecadViewer

Discover And Explore popular designs through the TOP 100



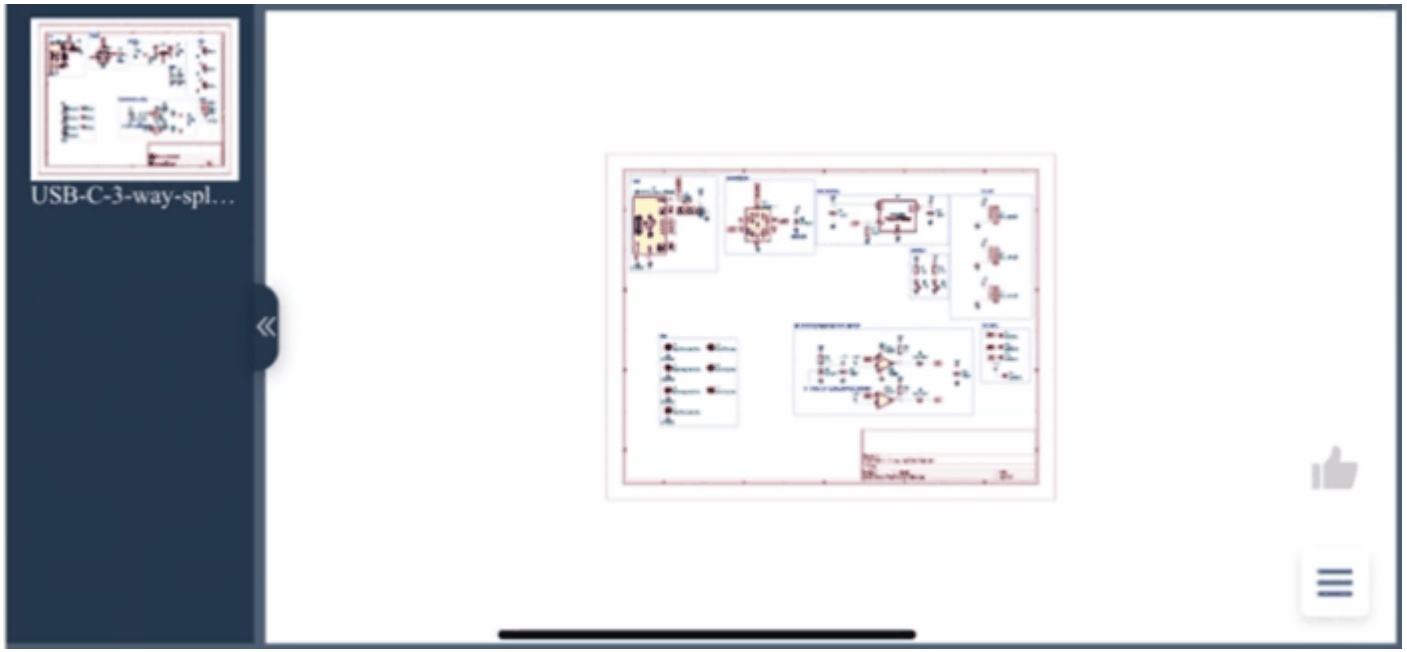
https://www.eda.cn/ecadViewer/top100


Online Viewer
Schematic
Inspecting
Sheet
Sheet pin
Symbol
Wire
Labels
Bus
Bus entry
drawings
Navigation
Labels with the same name
Sub-sheets
Extract
BOM
Value
Footprint
Quantity
Designator
Description
Supported Formats
KiCad
Altium
...
PCB
Inspecting
Net
Double click to inspect net associated with item
Items
Footprint
GraphicItem
Text
Pad
Zone
Via
Track
Adjust visibility and opacity
Navigation
Layers
Hide/Show
Presets
Nets
Convert
3D
built-in KiCad packages3D
Component
Zone
Track
Soldermask
Silkscreen

AI-Powered Design Interaction

Design-Level	Ask about the design’ s overall goals and intentions
	Identify the core components within the design
Component-Level	General information about its functionalities and applications
	Find similar components for easy comparisons or replacements
	Check connections between components for accuracy
	Review detailed pin information
	Identify any unconnected pins to ensure design integrity

RoadMap



Mobile Experience.mp4

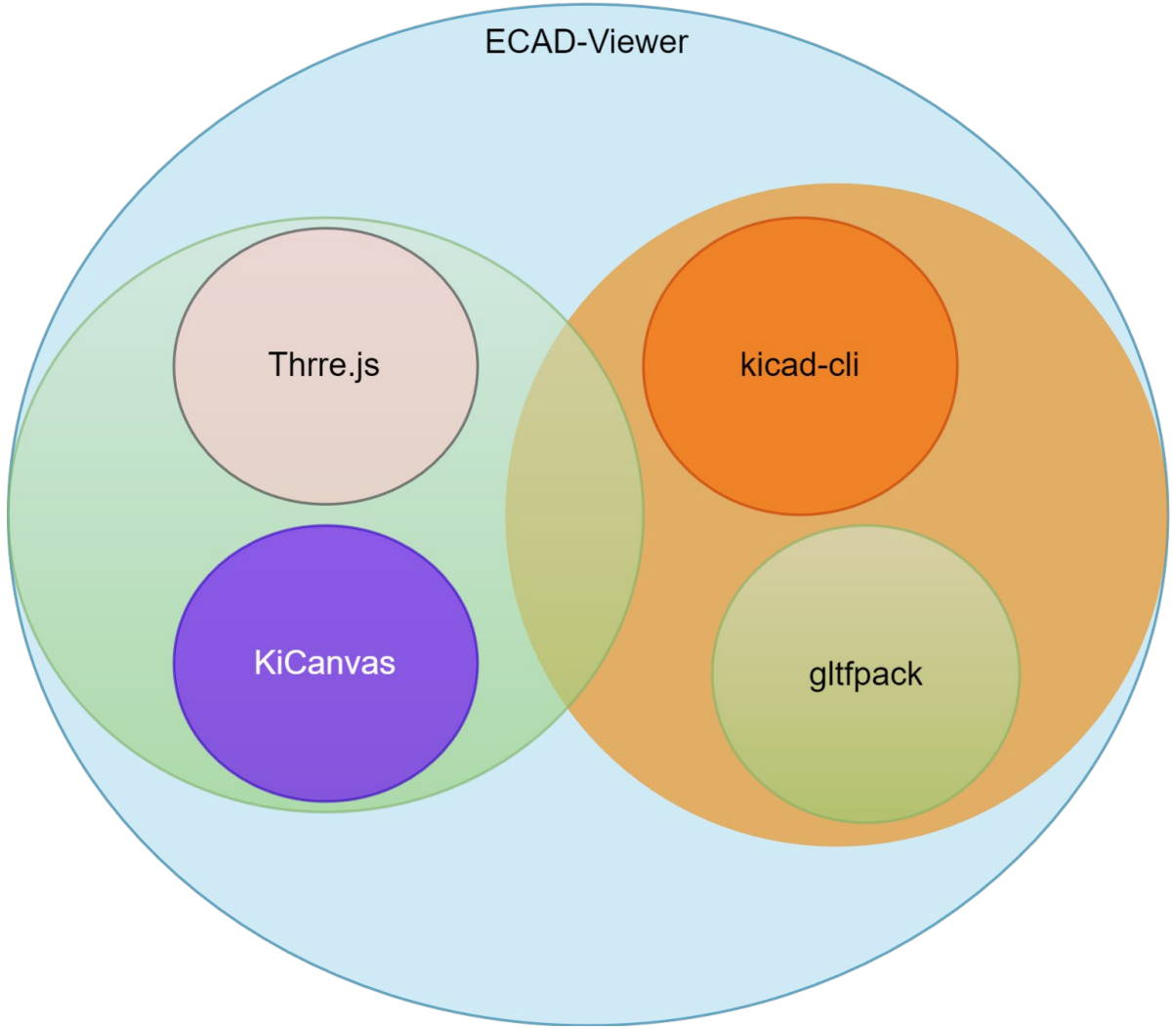
Core Components of ECAD-Viewer

kicad-cli : Converting AD designs to kicad designs, and converting .kicad_pcb to .gltf as well

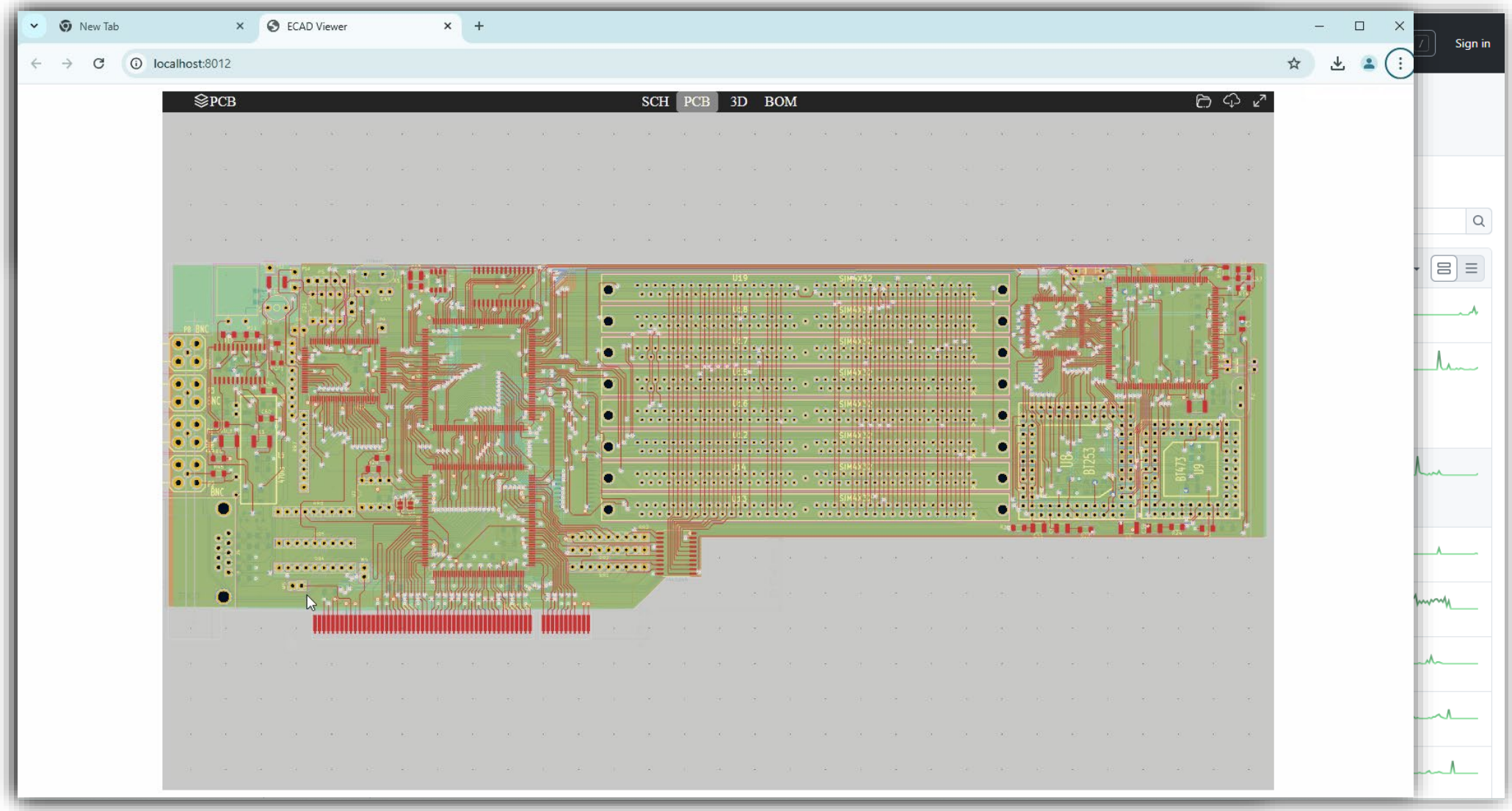
gltfpack : Compressing the gltf file

KiCanvas: Rendering the .kicad_pcb and .kicad_sch

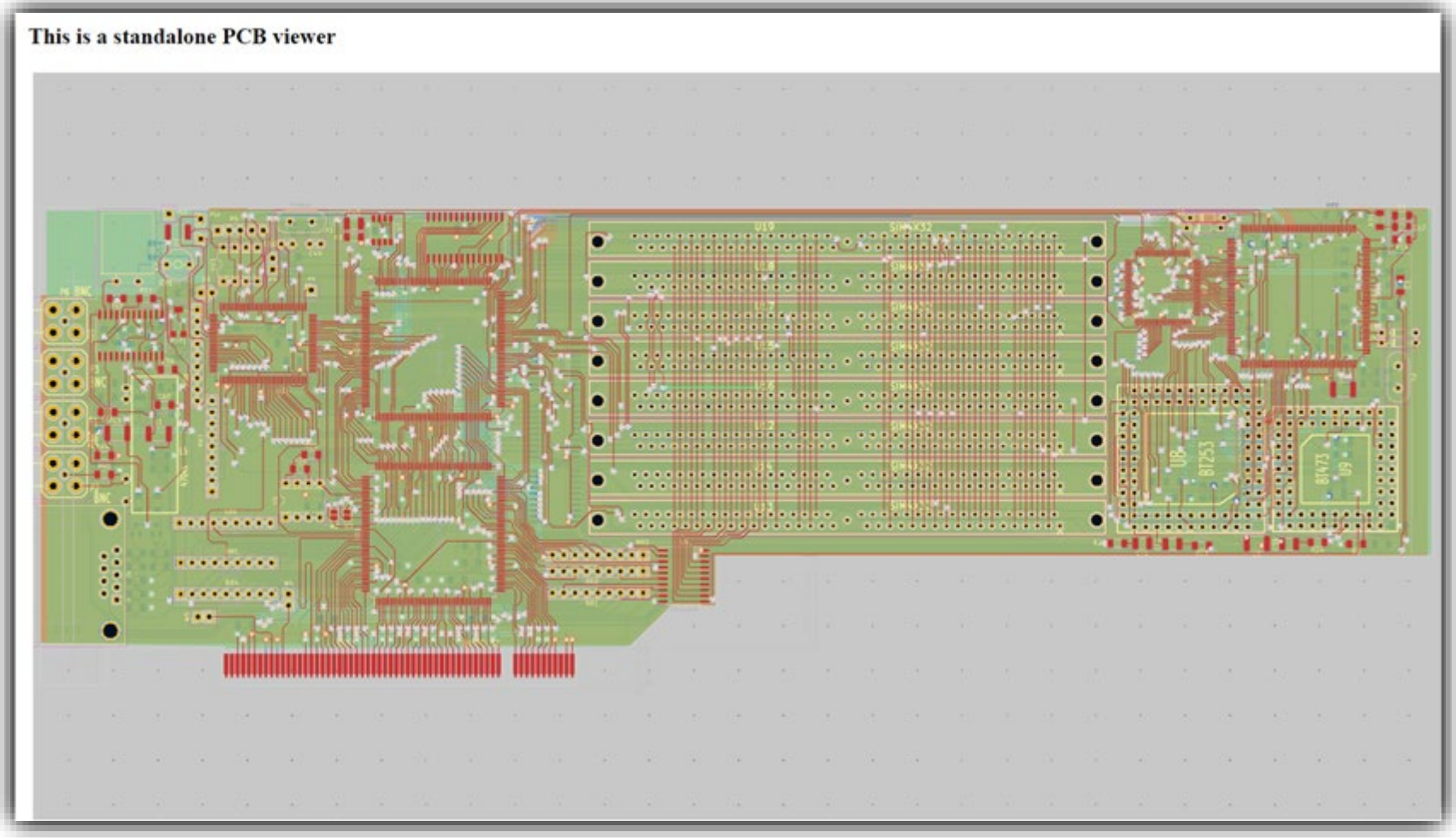
Three.js: Rendering the gltf



Integrating ECAD-Viewer To Your Website



Integrating ECAD-Viewer To Your Website



https://github.com/Huaqiu-Electronics/ecad-viewer/blob/master/debug/embedded.html

Blind coding

Those who ignore open source are coding with their eyes closed.

Expanding on KiCanvas

Non-goals

KiCanvas also has a list of specific non-goals. At this time, we won't be adding:

- Editing of any kind - KiCanvas is read only and that assumption is baked deeply within the code.
- Offline rendering
- 3D board and component rendering
- Server-side usage
- Comparison/visual diffing
- Specific integrations with front-end frameworks (React, Vue, etc.) - KiCanvas is built using Web Components and should work out of the box with all web frameworks.

https://github.com/theacodes/kicanvas/blob/main/docs/docs/roadmap.md

Why another repository instead of contributing back to the original project?

We are open to introducing ready-made frameworks, unlike the original, which insists on being a dependency-free library.

While remaining a reusable component, ECAD-Viewer offers the following features out of the box, combining the most advanced and leading-edge technologies, some of which were not intended in the original:

- **General Features:**
  - In-depth secondary development based on KiCad to support the import of Altium designs and the generation of 3D models from `kicad_pcb`.
  - Support for loading projects from ZIP files.

https://github.com/Huaqiu-Electronics/ecad-viewer/blob/master/README.md

Being Advised to introduce gltfpack to compress glb

Browser becomes unresponsive when loading the attached model

Questions

liangtie 2 Apr 7

github.com

liangtie/kicad-glb-sample/blob/381ba31bfdb05f6d2e9a9b811ee3d94eb1aaec91/video.glb 7

This file is binary. show original

This is a PCB model exported from Kicad, approximately 70 MB large.

Both the three.js glb viewer and babylon.js glb viewer become unresponsive while loading it through drag-drop.

Is there any way to load it without blocking the browser?

manthrax Apr 7

Your model is 68 megabytes large. That takes a while to upload/download.
Once it's loaded… it seems to run poorly.
There are 18251 meshes in the file. That is probably the cause of the slow rendering. They either need to use instancing, or be merged into some larger batches.

There are 667594 triangles in the model, which is a lot, but not impossible as long as you're only rendering that circuit board and not much else.

You probably need to run it through an optimizer like meshopt. and/or reduce the number of drawcalls/texture sizes.

Here is a meshopt compressed version of your 68 meg glb shrunk down / optimized to ~3 megs.
video.glb.meshopt.glb (2.6 MB)

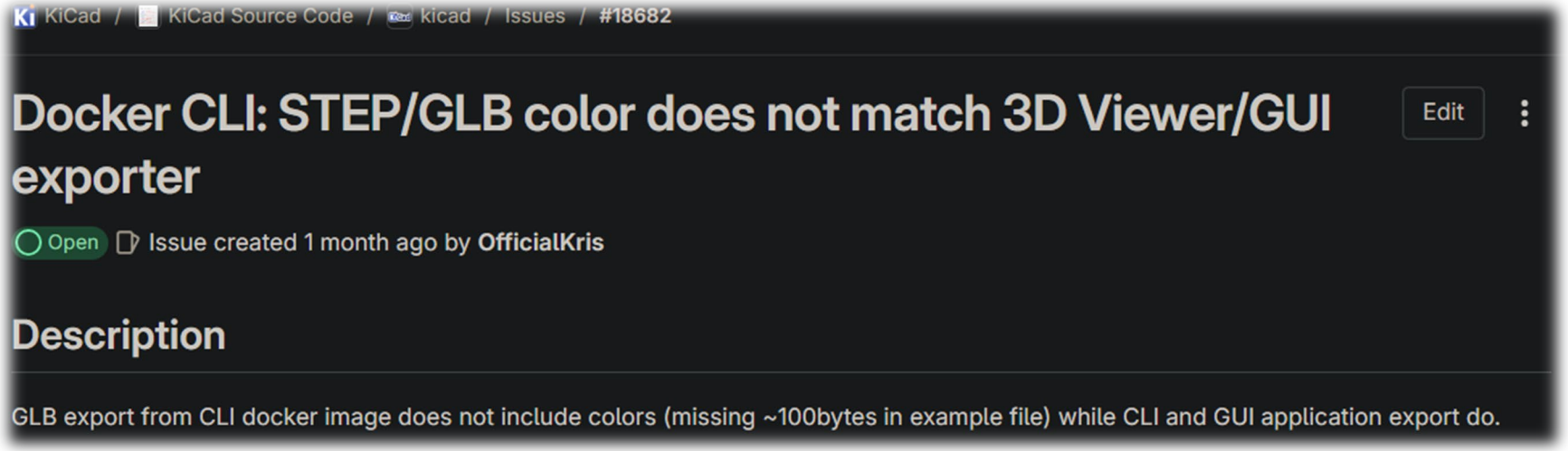
I used these settings:

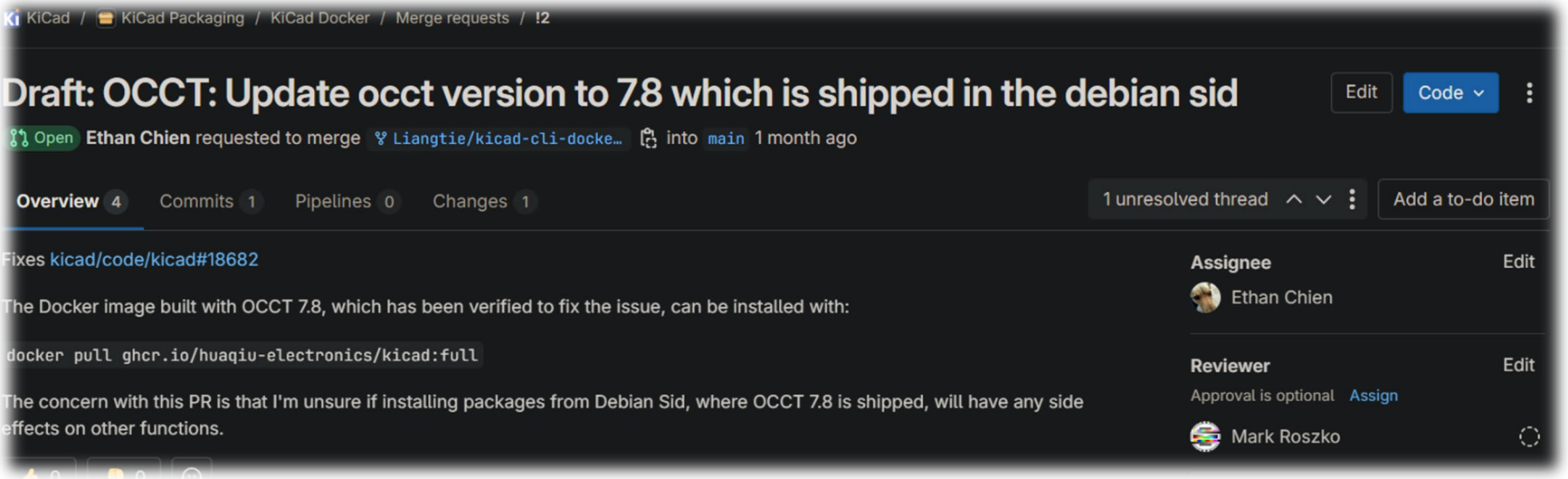
```
./gltfpack -i ${1} -v -cc -tc -ts 0.5 -o ${1}.meshopt.glb
```

edit: @GitHubDragonFly I didn't see your message before posting 😃 Yeah… basically what you said!

Solution 3 ❤ Reply

Fixing GLB Missing Color





Receiving 3D model improvements

KiCad / KiCad Source Code / kicad / Issues / #2072

3D export: include layers e.g. copper, soldermask, silkscreen etc.

Edit

Closed Issue created 7 years ago by **KiCad Bot**

KiCad / KiCad Source Code / kicad / Commits / b89d4a7f

Commit b89d4a7f authored 5 months ago by dsa-t

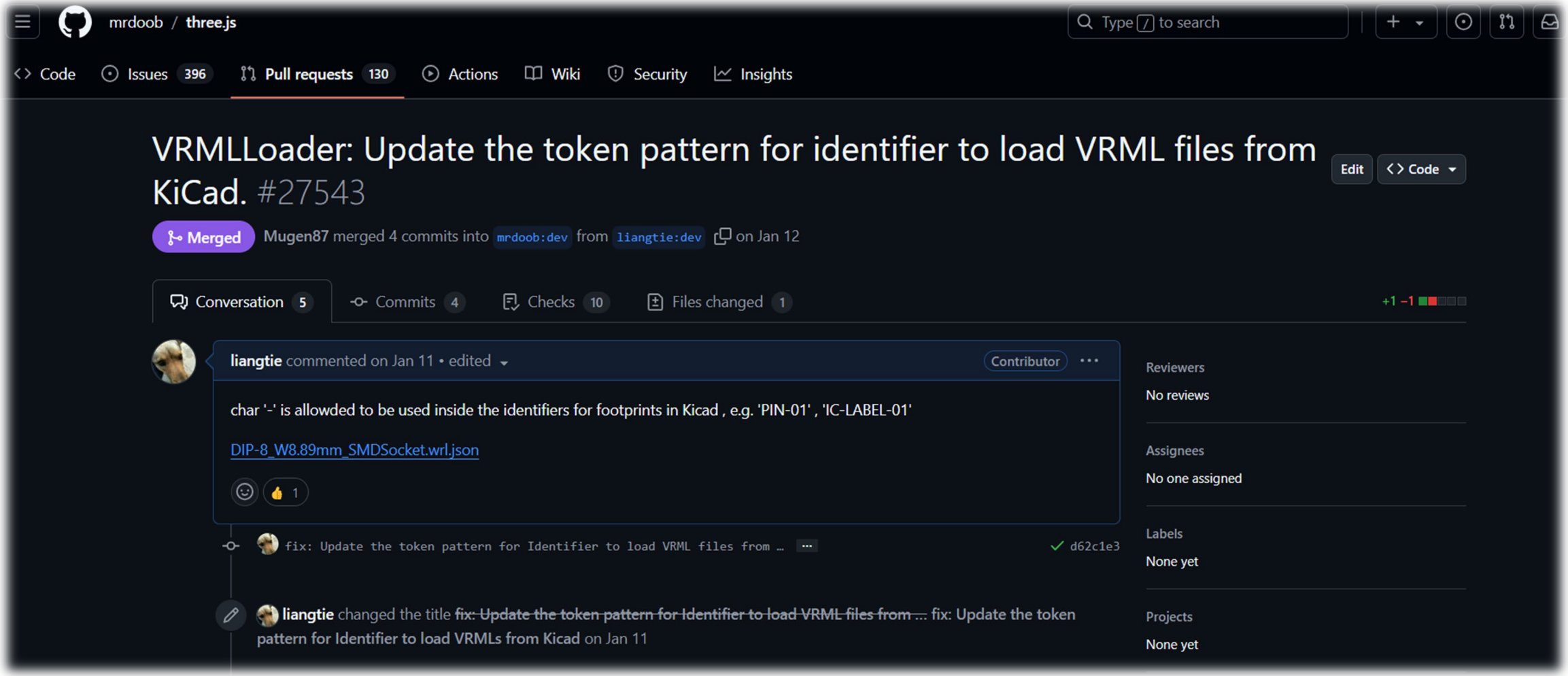
Browse files Options

3D model export improvements:

- Option to export pads separately from tracks+vias
- Options export silkscreen and soldermask as flat faces
- Improve 3D model export dialog layout
- Use VisMaterialTool to specify metallic-roughness for glTF.
- Less OCCT boolean operations (faster, less bugs)

Fixes #2072

Contributing Fix to the VRMLLoader



Issuing bug with MSVC to the SWIG project

Questions?

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THANK YOU

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