

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



AwesomeDesign.
tgz AwesomeDesign.
zip



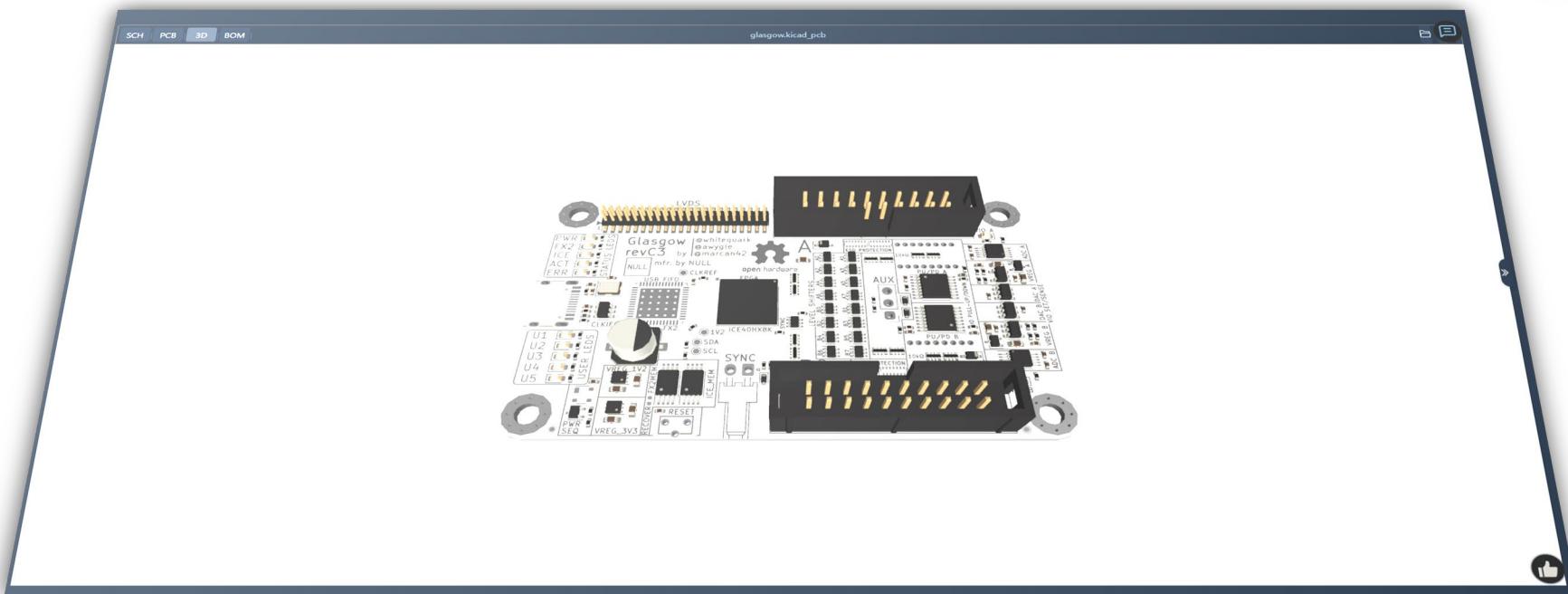
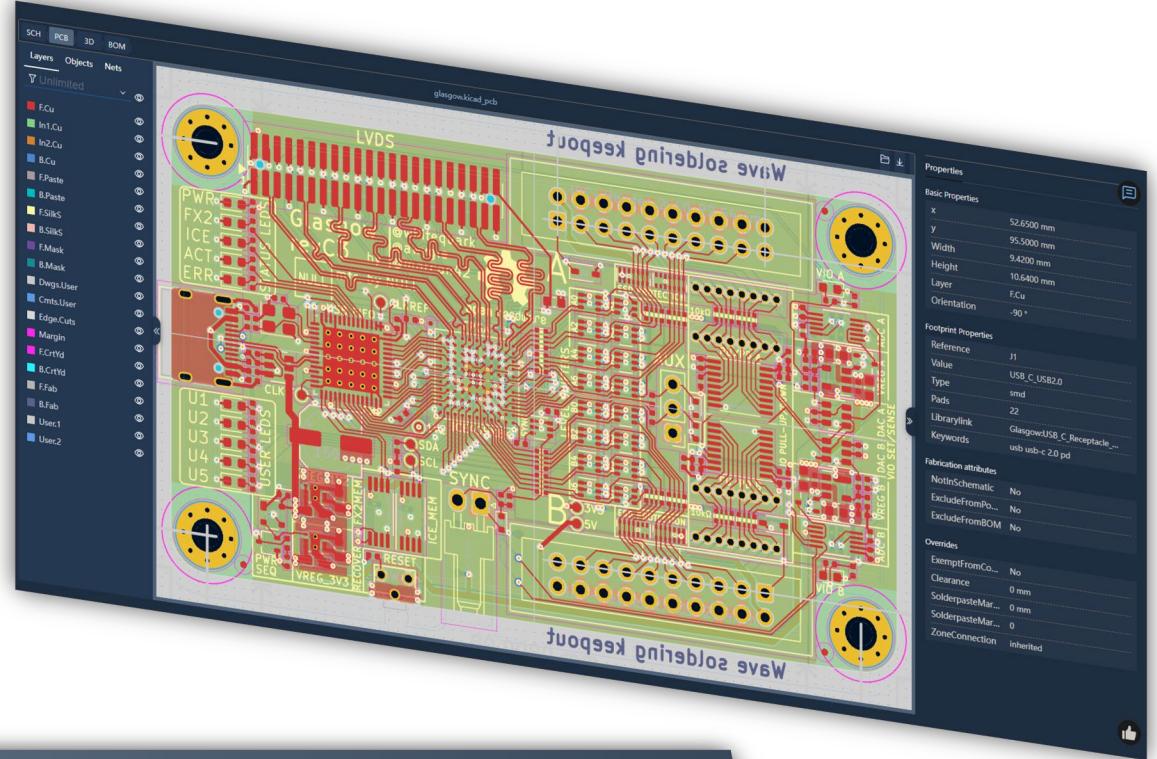
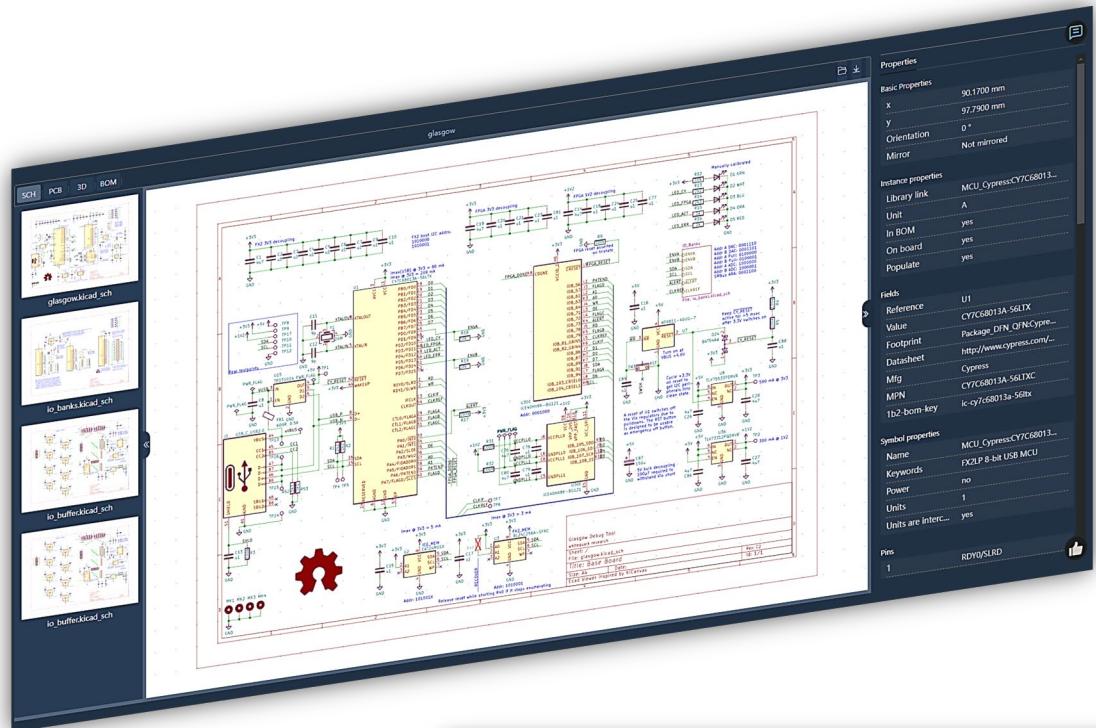
AwesomeDesign



AwesomeDesign.
pdf



AwesomeDesign.
svg

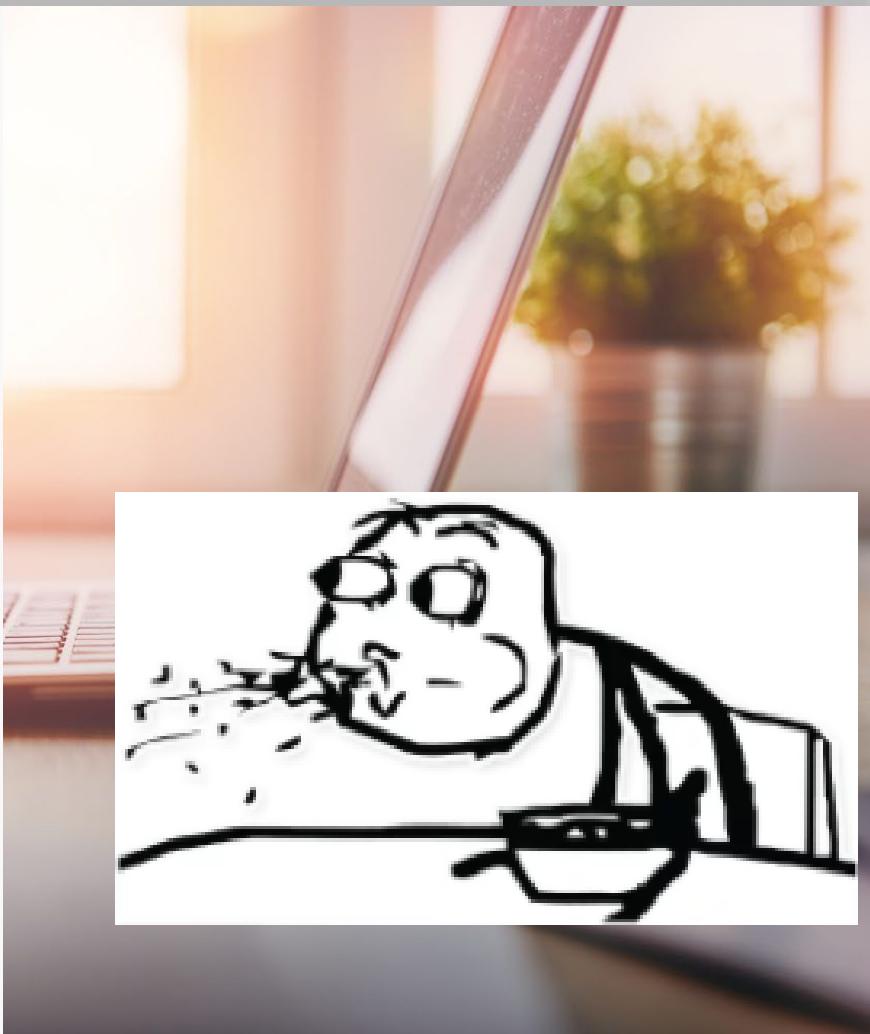


No One Is Experienced at the Beginning

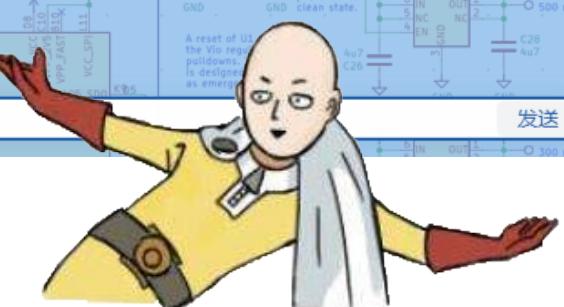
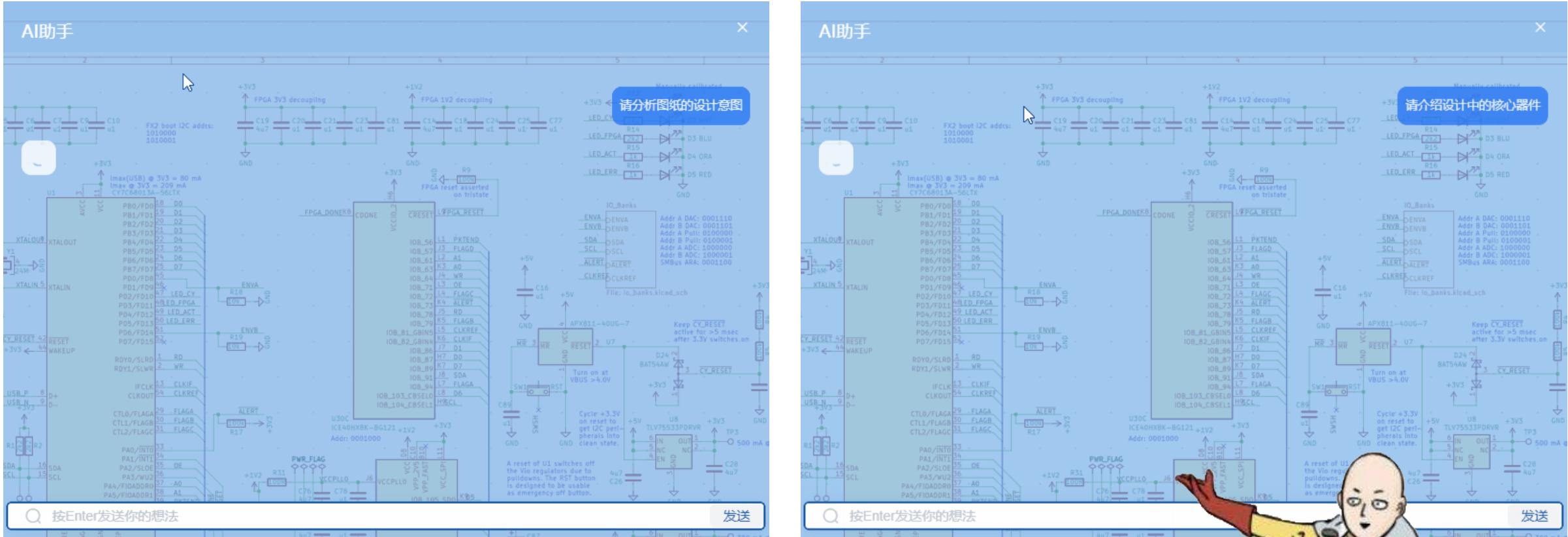


When you take over a legacy project

```
● ➔ 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
```

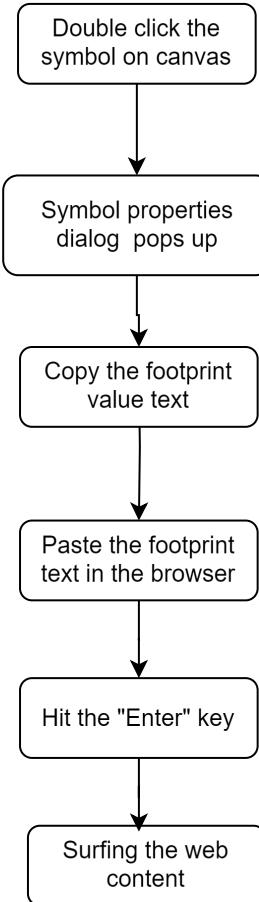


AI Saves Your Hair: Master Designs, Skip the Hassle

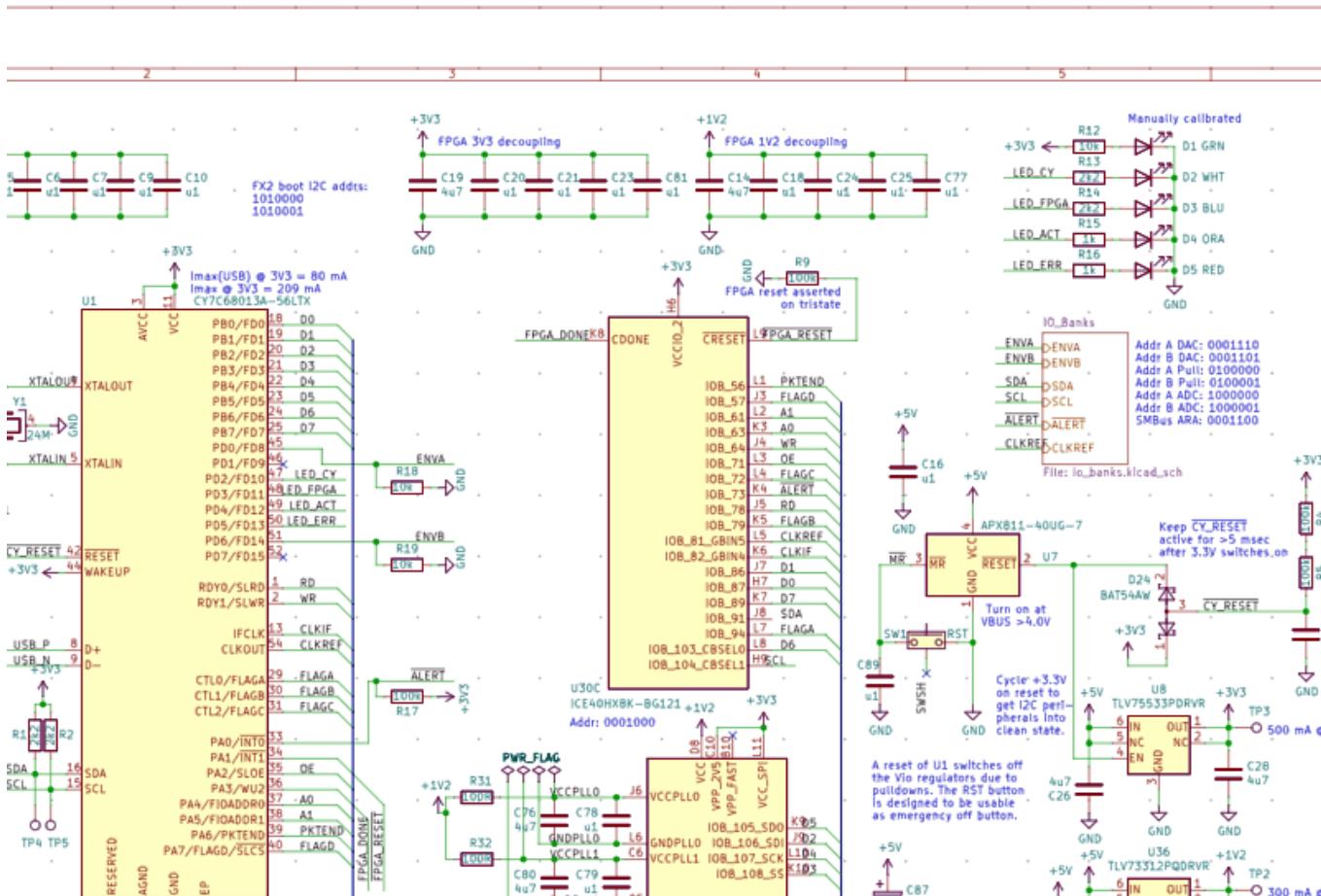
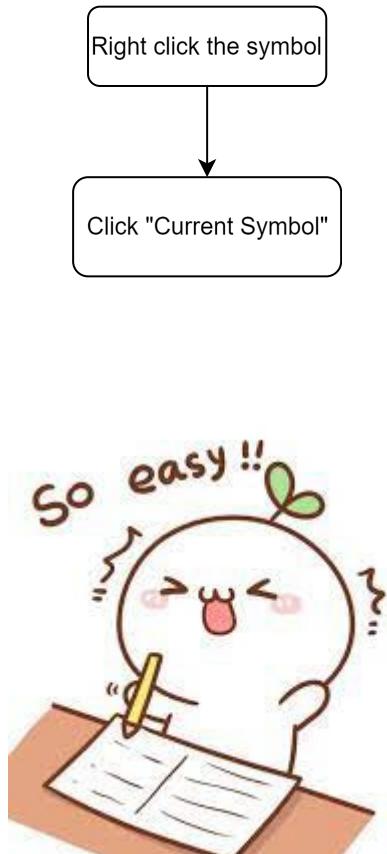


有趣
interesting

Steps to Find Specifications for a Symbol



Steps to Find Specifications for a Symbol with AI



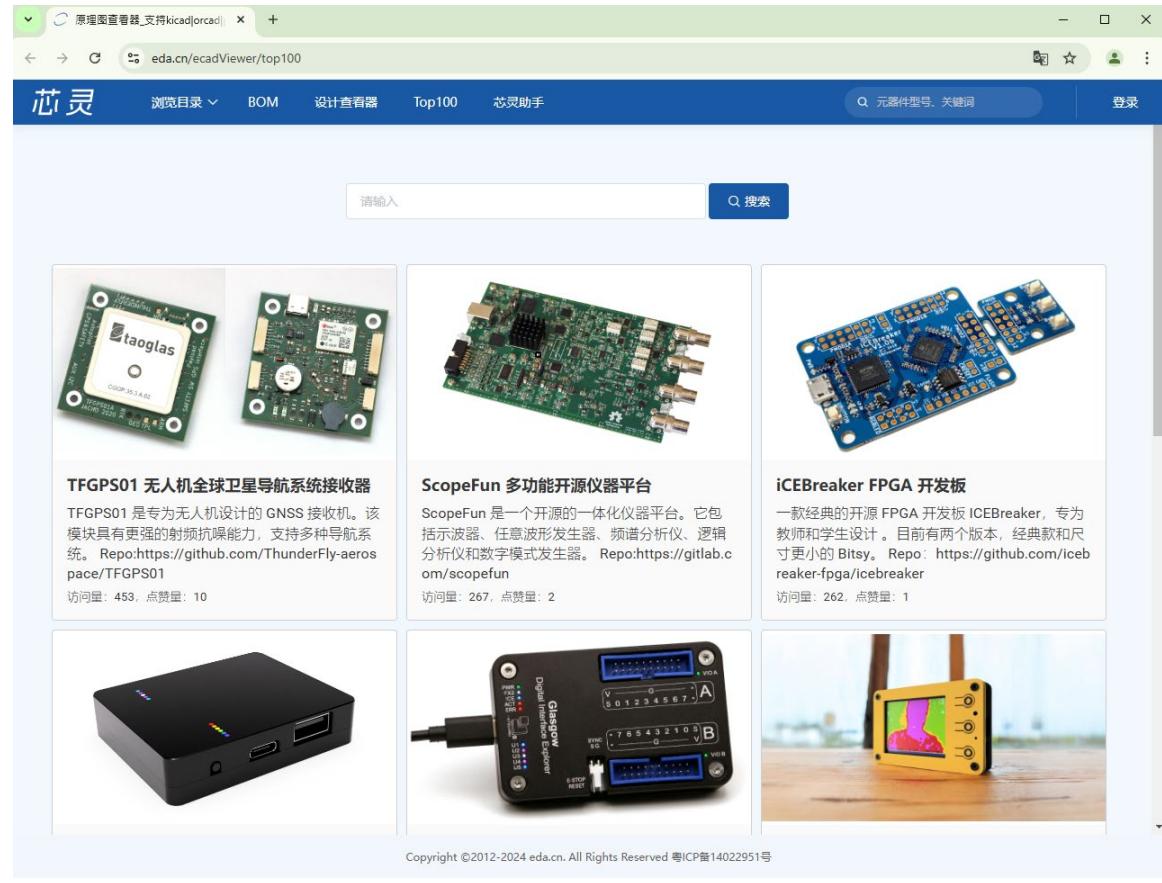
Ways to Explore ECAD-Viewer

Upload and view your own designs directly in the design viewer

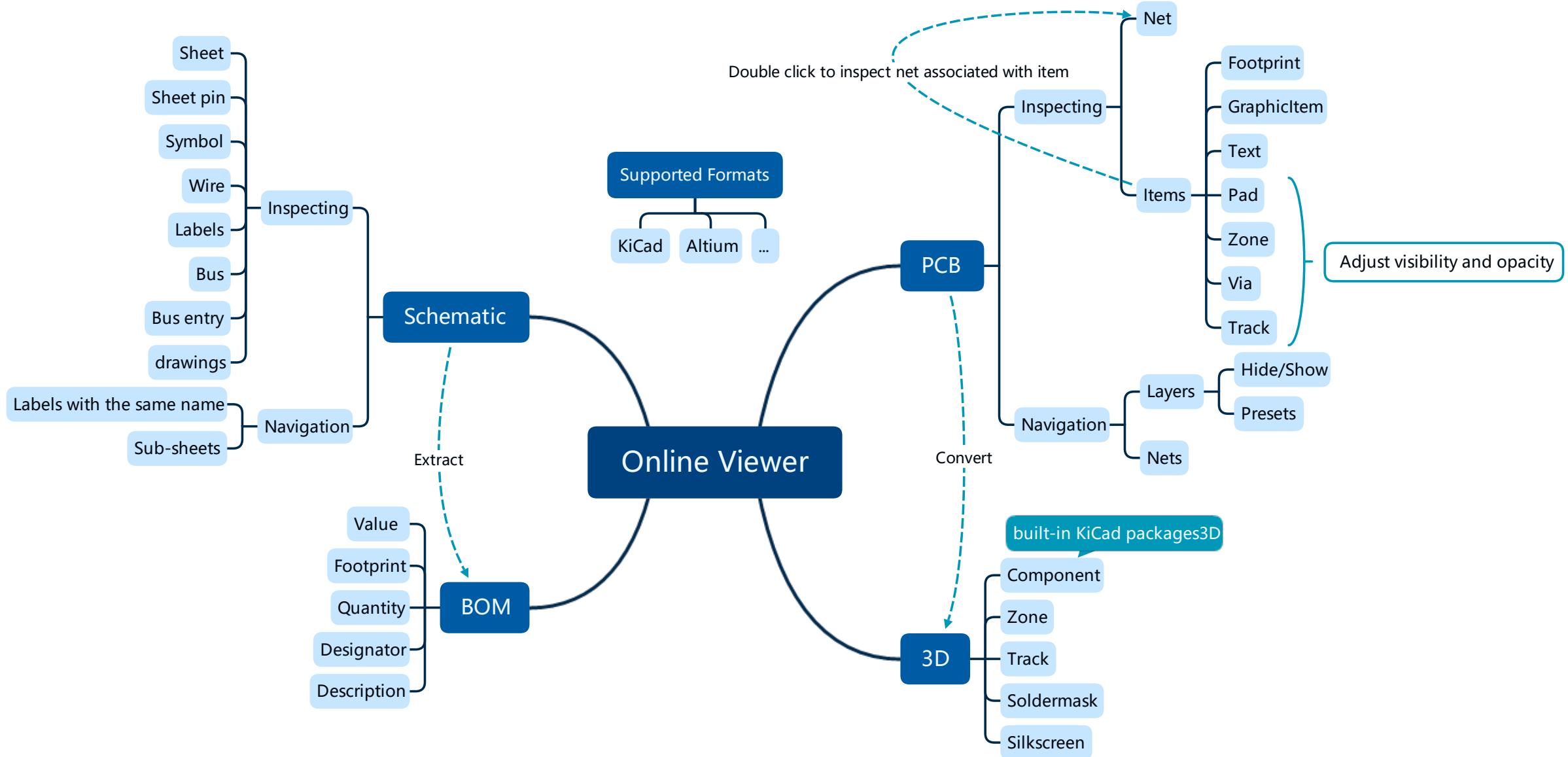


<https://www.eda.cn/ecadViewer>

Discover And Explore popular designs through the TOP 100



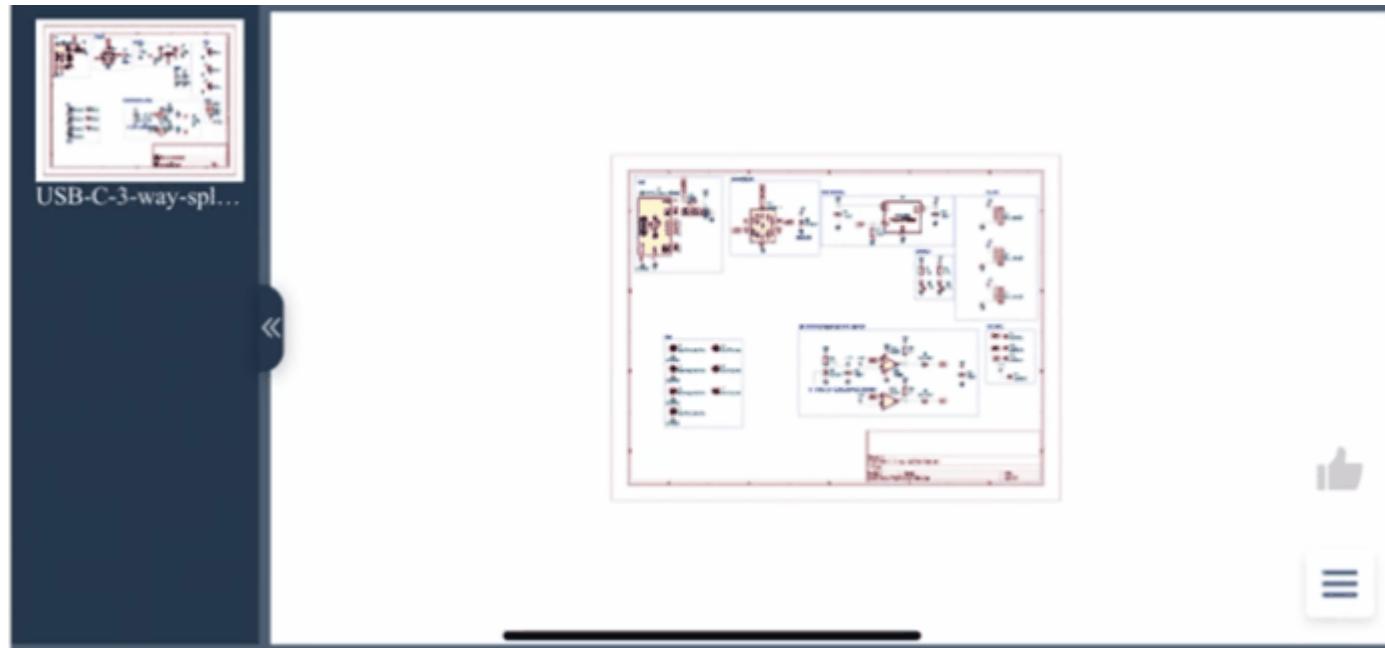
<https://www.eda.cn/ecadViewer/top100>



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

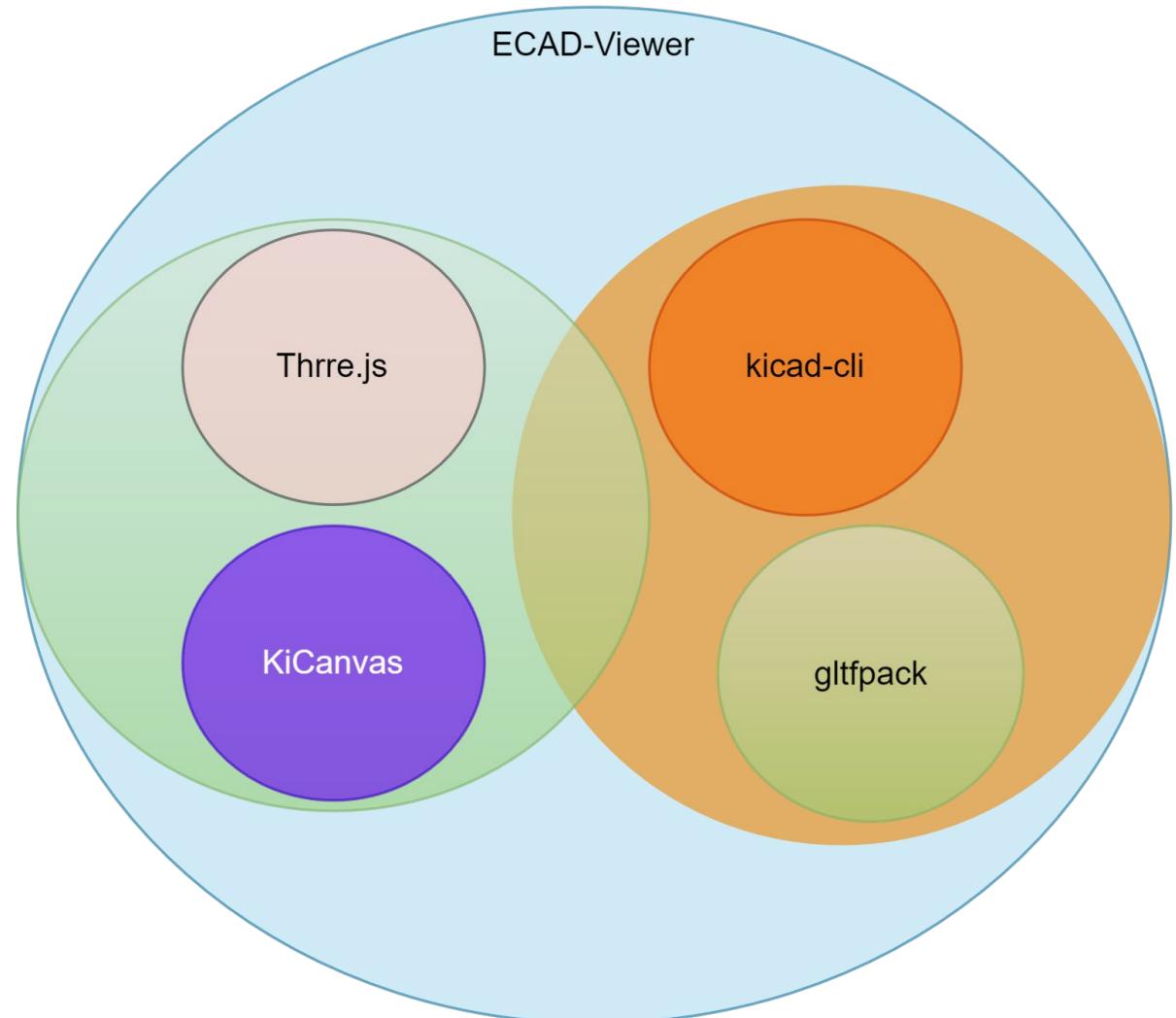
Core Components of ECAD-Viewer

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

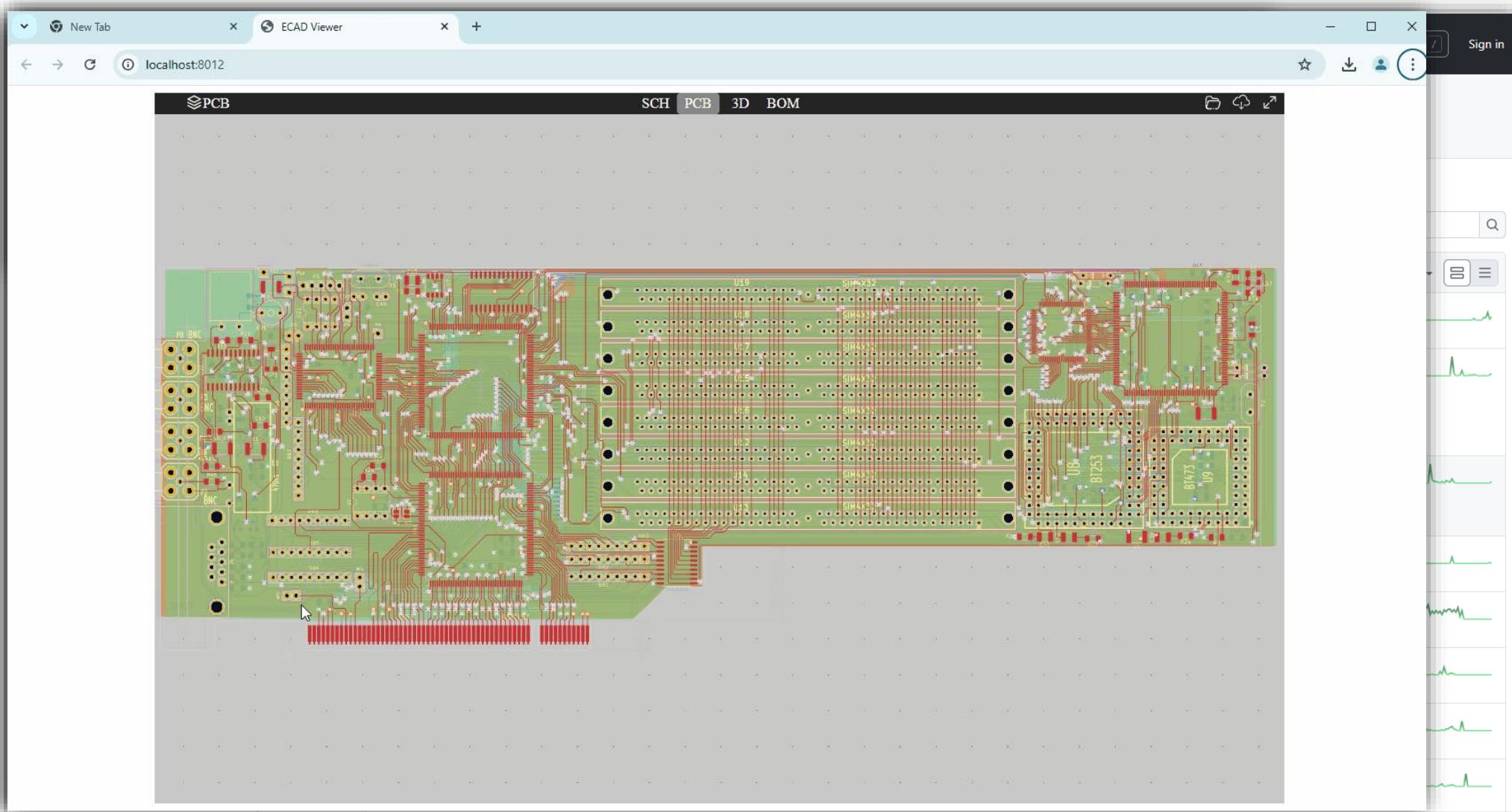
gltfpack : Compressing the gltf file

KiCanvas: Rendering the .kicad_pcb and .kicad_sch

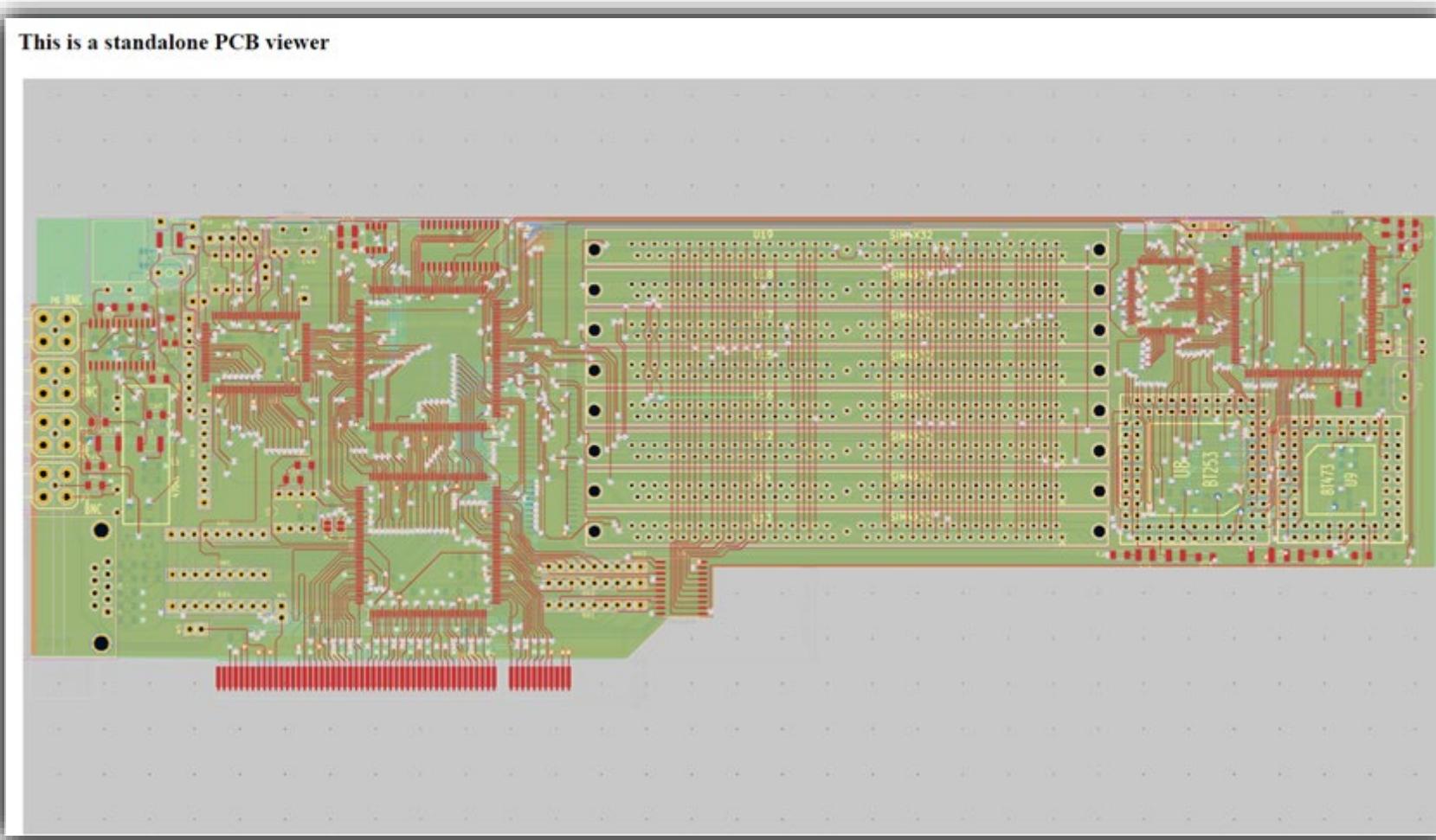
Three.js: Rendering the gltf



Integrating ECAD-Viewer To Your Website



Integrating ECAD-Viewer To Your Website



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:

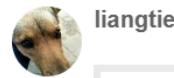
- General Features:
 - In-depth secondary development based on KiCad to support the import of Altium designs and the generation of 3D models from [kicad_pcb](#).
 - Support for loading projects from ZIP files.

<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](https://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

KiCad / KiCad Source Code / kicad / Issues / #18682

Docker CLI: STEP/GLB color does not match 3D Viewer/GUI exporter

Open Issue created 1 month ago by OfficialKris

Description

GLB export from CLI docker image does not include colors (missing ~100bytes in example file) while CLI and GUI application export do.

KiCad / KiCad Packaging / KiCad Docker / Merge requests / !2

Draft: OCCT: Update occt version to 7.8 which is shipped in the debian sid

Open Ethan Chien requested to merge Liangtie/kicad-cli-docke... into main 1 month ago

Overview 4 Commits 1 Pipelines 0 Changes 1

Fixes kicad/code/kicad#18682

The Docker image built with OCCT 7.8, which has been verified to fix the issue, can be installed with:

```
docker pull ghcr.io/huaqiu-electronics/kicad:full
```

The concern with this PR is that I'm unsure if installing packages from Debian Sid, where OCCT 7.8 is shipped, will have any side effects on other functions.

Assignee	Edit
 Ethan Chien	
Reviewer	Edit
Approval is optional Assign	

OCCT 7.6



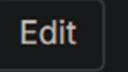
OCCT 7.8

Receiving 3D model improvements

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

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

Closed Issue created 7 years ago by KiCad Bot

Edit : 

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+viases
- 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

The screenshot shows a GitHub pull request page for the `three.js` repository. The repository name is `mrdoob / three.js`. The pull request is titled "VRMLLoader: Update the token pattern for identifier to load VRML files from KiCad." and has the ID #27543. The status of the pull request is "Merged". It was merged by `Mugen87` on Jan 12, 2024, from the `liangtie:dev` branch into the `mrdoob:dev` branch. The pull request has 4 commits, 10 checks, and 1 file changed. A comment from `liangtie` on Jan 11, 2024, states: "char '-' is allowed to be used inside the identifiers for footprints in Kicad , e.g. 'PIN-01' , 'IC-LABEL-01'" and provides a link to a file named `DIP-8_W8.89mm_SMDSocket.wrl.json`. The comment has 1 like. The commit message is "fix: Update the token pattern for Identifier to load VRML files from ...". The commit hash is `d62c1e3`. The pull request has no reviews, assignees, or labels. It is associated with none yet projects.

Code Issues Pull requests Actions Wiki Security Insights

VRMLLoader: Update the token pattern for identifier to load VRML files from KiCad. #27543

Merged · Mugen87 merged 4 commits into `mrdoob:dev` from `liangtie:dev` on Jan 12

Conversation 5 Commits 4 Checks 10 Files changed 1

+1 -1

`liangtie` commented on Jan 11 • edited

char '-' is allowed to be used inside the identifiers for footprints in Kicad , e.g. 'PIN-01' , 'IC-LABEL-01'

[DIP-8_W8.89mm_SMDSocket.wrl.json](#)

1

`liangtie` fix: Update the token pattern for Identifier to load VRML files from ...

`d62c1e3`

`liangtie` changed the title fix: Update the token pattern for Identifier to load VRML files from ... fix: Update the token pattern for Identifier to load VRMLs from Kicad on Jan 11

Reviewers
No reviews

Assignees
No one assigned

Labels
None yet

Projects
None yet

Issuing bug with MSVC to the SWIG project

The screenshot shows a GitHub issue page for the `swig` repository. The title of the issue is "MSVC 17.11 is buggy and fails to compile some SWIG-generated wrappers involving enums #3008". The issue was opened by `liangtie` on Aug 30, 2023, and has 20 comments. The issue is currently open. On the right side of the page, there are sections for Assignees (No one assigned), Labels (C++), Projects (None yet), Milestone (No milestone), and Development (Successfully merging a pull request may close this issue). A link to a Python pull request is also present.

MSVC 17.11 is buggy and fails to compile some SWIG-generated wrappers involving enums #3008

liangtie commented on Aug 30 • edited

While building KiCad 8.0.4 from source with the latest MSVC version 14.41.34120, the build fails when compiling `pcbnew_wrap.cxx`, producing the following error message. The build completes successfully with the previous MSVC version 14.40.33807.

The definition for `PCB_LAYER_ID` can be found at:
https://gitlab.com/kicad/code/kicad/-/blob/master/include/layer_ids.h#L59

The full log can be found in the attachment.
[kicad 8.0.4-fail-with-msvc-14.41.34120.log](#)

```
[1573/1871] Building CXX object pcbnew\CMakeFiles\pcbnew_kiface_objects.dir\pcbnew_wrap.cxx.obj
FAILED: pcbnew/CMakeFiles\pcbnew_kiface_objects.dir\pcbnew_wrap.cxx.obj
C:\PROGRAM\MICROS2\2022\ENTERPRISE\VC\Tools\MSVC\1441.341\bin\Hostx64\x64\cl.exe /nologo /TP -DBOOST_ALL_NO_LIB -DBOOST_LOCALE_DYN_LINK -DBOOST_LOCALE_NO_LIB -DBOOST_UUID_FORCE_AUTO_LINK -DGLM_FORCE_CTOR_INIT -DHAVE_STDINT_H -DKICAD_BUILD_ARCH=x64 -DKICAD_BUILD_ARCH_X64 -DKICAD_CONFIG_DIR=kicad -DKICAD_SCRIPTING_WXPYTHON -DKICAD_SIGNAL_INTEGRITY -DKICAD_UPDATE_CHECK -DKICAD_WIN32_DPI_AWARE=1 -DNANOdbc_ENABLE_UNICODE -DNOMINMAX -DPCBNNEW -DUNICODE -DUSINGZ -D_CRT_NONSTDC_NO_DEPRECATED -D_CRT_SECURE_NO_WARNINGS -D_SCL_SECURE_NO_WARNINGS -D_UNICODE -D_USE_MATH_DEFINES -ID:\a\kicad-win-builder\kicad-win-builder.build\kicad\include -ID:\a\kicad-win-builder\kicad-win-builder.build\kicad\pcbnnew -ID:\a\kicad-win-builder\kicad-win-builder.build\kicad\resources\msw -ID:\a\kicad-win-builder\kicad-win-builder.build\kicad\pcbnnew\dialogs -
```

Assignees
No one assigned

Labels
C++

Projects
None yet

Milestone
No milestone

Development
Successfully merging a pull request may close this issue.

Python - fix compilation error with the latest MS...
liangtie/swig

Questions?

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

THANK YOU



Ethan Chien
Intelligent Manufacturing Center, Huachu