# FFGraphics

## A new FreeFEM plot interface

Quentin Tessier

AIRTHIUM
Energy storage

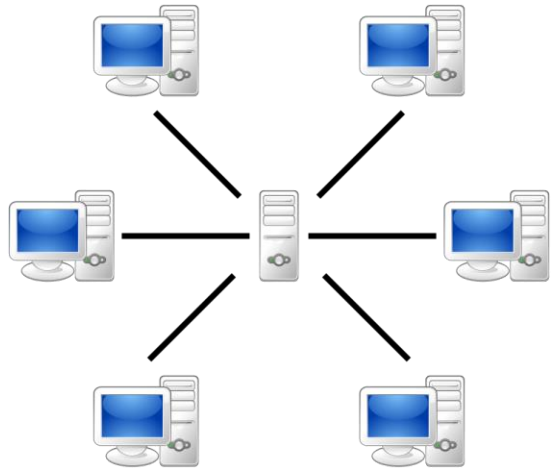
# Why replace ffglut ?

- Apple is removing OpenGL from their operating system.
- ffglut uses OpenGL 1.0 which is inefficient and out-dated.
- The software can be improved with new functionalities.

# FFGraphics: New Server / Client model

- FreeFEM will host a server on which multiple clients can connect over the local network or the internet.

- You only need to provide an IP address and a port to the client.



# Server

- The server uses JSON format to serialize data for cross platform read/write.

- The JSON is compressed using the cbor compression algorithm and is sent on the network using sockets.

# Client

- The client receives the data in multiple parts and reconstructs the packet.

- Since it uses sockets, the client isn't language dependent. FFGraphics client is written in C++ but other languages will work as well (Python, JavaScript, Java …).

# FFGraphics uses the Vulkan 3D engine

- It's a low-level cross platform API (MoltenVK on Mac).
- It gives more control to the developer over the graphics card, but the trade-off is the code complexity and verbosity.
- It has great debugging tools through validation layers.

# FFGraphics Demo

# Next Steps

## Integration of functionalities :

- Save and reload plots
- Display parameters modifiers (iso-nbr, isovalues and others)
- Color modifiers
- Export and import to other formats (VTK, msh, …)
- Custom memory management

## Contributions are welcome ! Contact me at :

- Email : quentin.tessier@epitech.eu
- Github : https://github.com/FreeFEM/FreeFEM-graphic-client

# Thanks for listening!

AIRTHIUM
Energy storage