

ELECTRIC BLOCKS DEMO

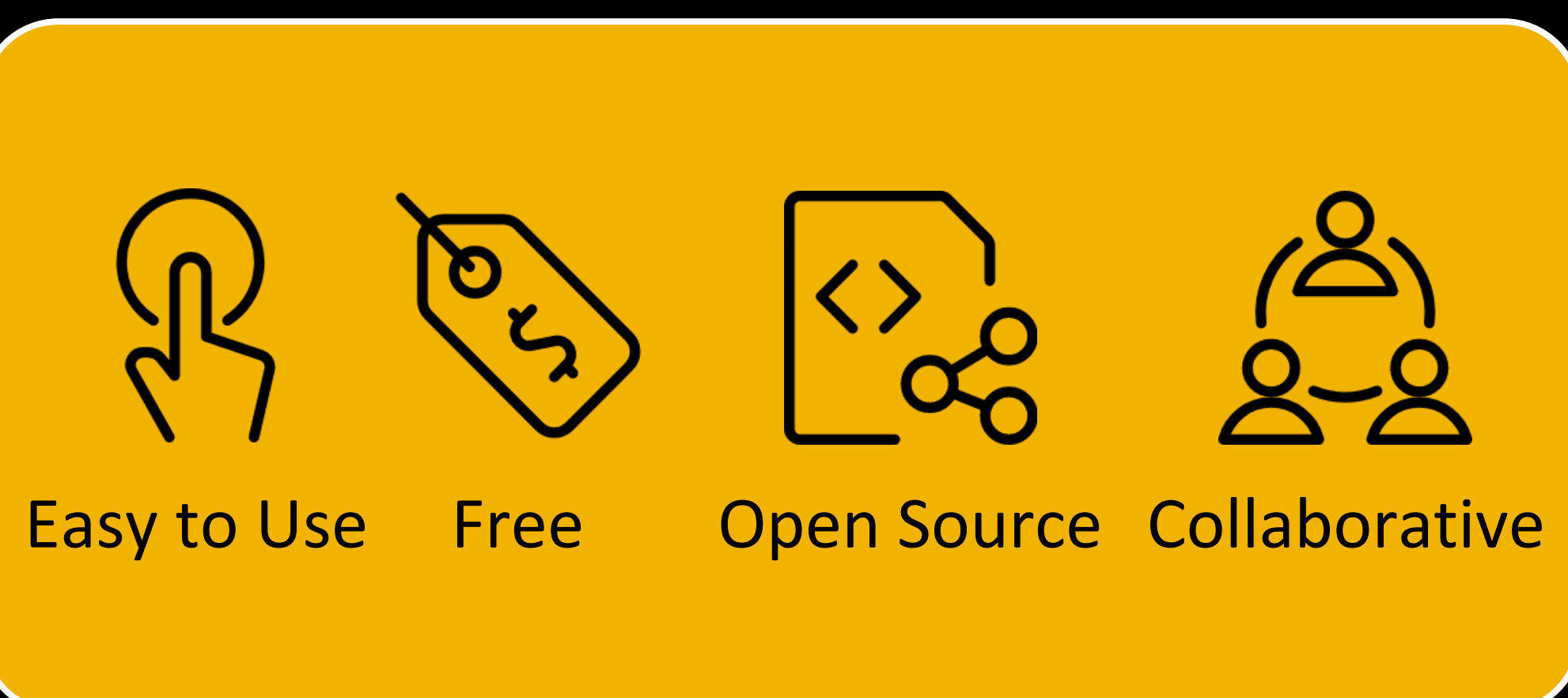
To enable the creation and use of realistic and accurate virtual reality models of electric power transmission, distribution, control, and usage scenarios for research and instructional purposes.

BACKGROUND

Power engineers utilize software tools to create and model electrical grids. These tools can then simulate electrical behavior by performing a "power flow study."

Traditional tools used for these purposes tend to be expensive, difficult to use, and inaccessible to beginners. Our project aims to solve these issues by allowing users to model power systems virtually in Minecraft.

VALUE PROPOSITION



KEY REQUIREMENTS

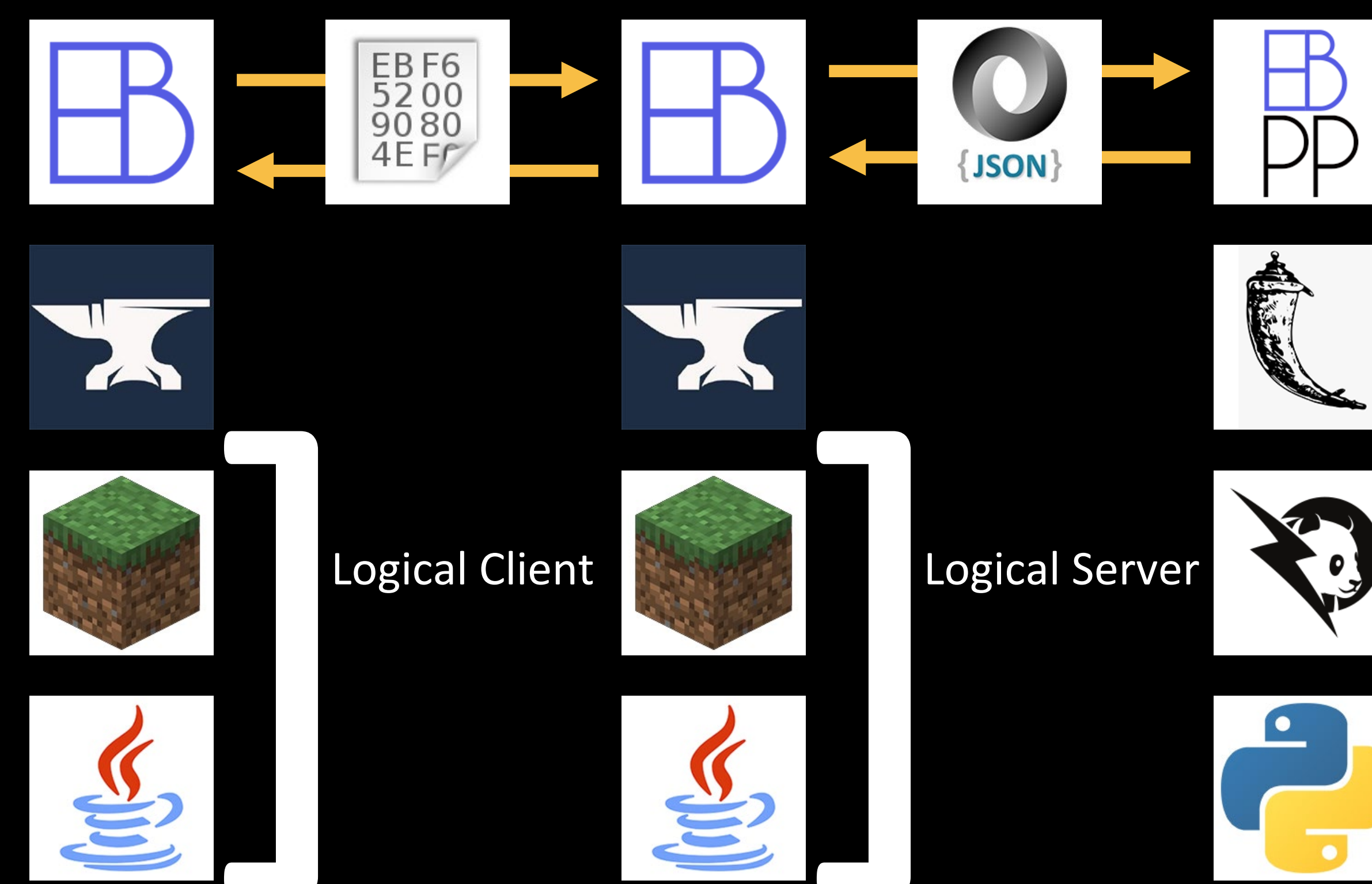
- Accurately Model and Simulate Power Flow
- Easy to Use
- Provide Real-Time Interaction and Collaboration
- Completely Free and Open Source



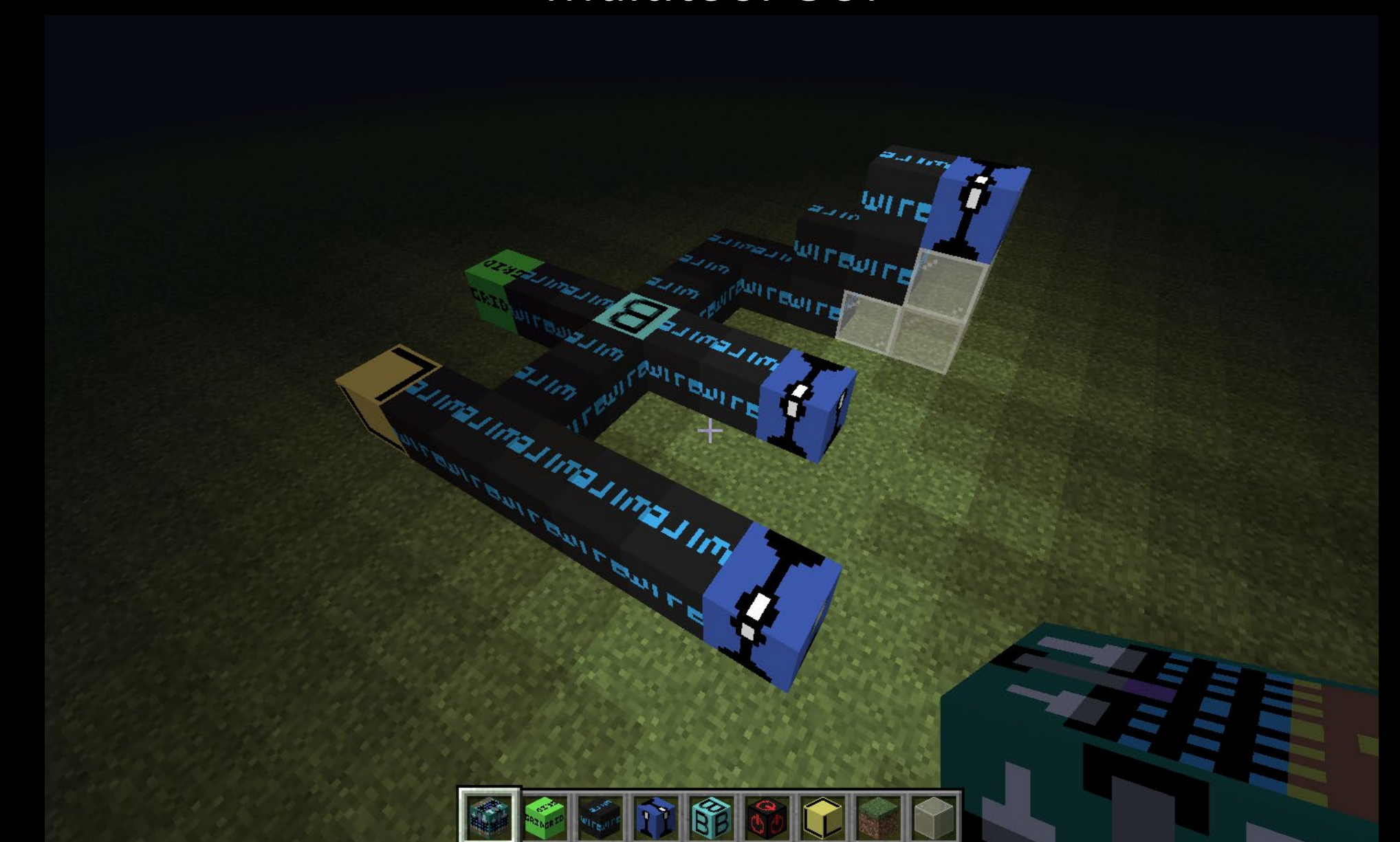
Grid, Wire, Lamp, Bus, Generator, Load, Transformer

Game Mod		Simulator
User Interface		Power Flow Backend
 Electric Blocks Mod	 Electric Blocks Mod	 Compatibility Layer
 Modding Platform	 Modding Platform	 DSS Python
 Minecraft Base Game	 Minetest Base Game	 OpenDSS Simulator

FINAL STACK



Multitool GUI



Network Bus Design Demonstration

CONCLUSIONS

Electric Blocks provides a great platform for novice power engineers in universities and high schools, and can be used by engineers for rapid, collaborative prototyping and testing of microgrids as part of the design process. Additionally, Electric Blocks can serve as a model on how power flow software can be made more user friendly and accessible.

RECOMMENDATIONS

Electric Blocks is easily expandable. Future teams could implement:

- 3 Phase Power
- Presets for Electrical Elements
- Network Diagnostics
- Time Series Electrical Elements
- Real Life Limitations (e.g. wire burns or glows when overloaded)

ACKNOWLEDGEMENTS

Designed by Zach Sugano and Christian Whitfield for Dr.
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For more info visit <https://electricblocks.github.io>