MICHIGAN STATE UNIVERSITY

Beta Presentation

Visualizing Neural Network Gradients

The Capstone Experience

Team Magna VNNG

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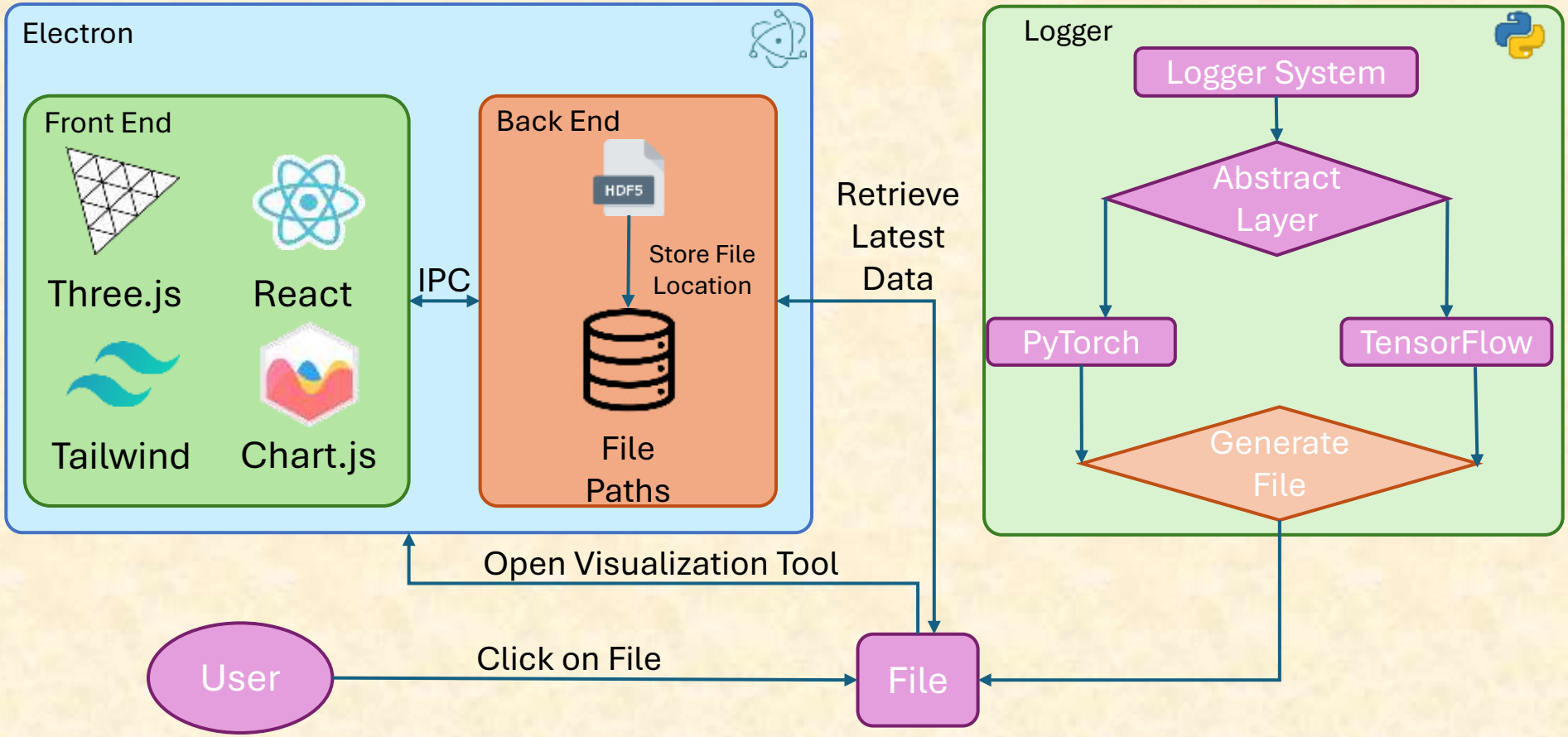
From Students…
…to Professionals

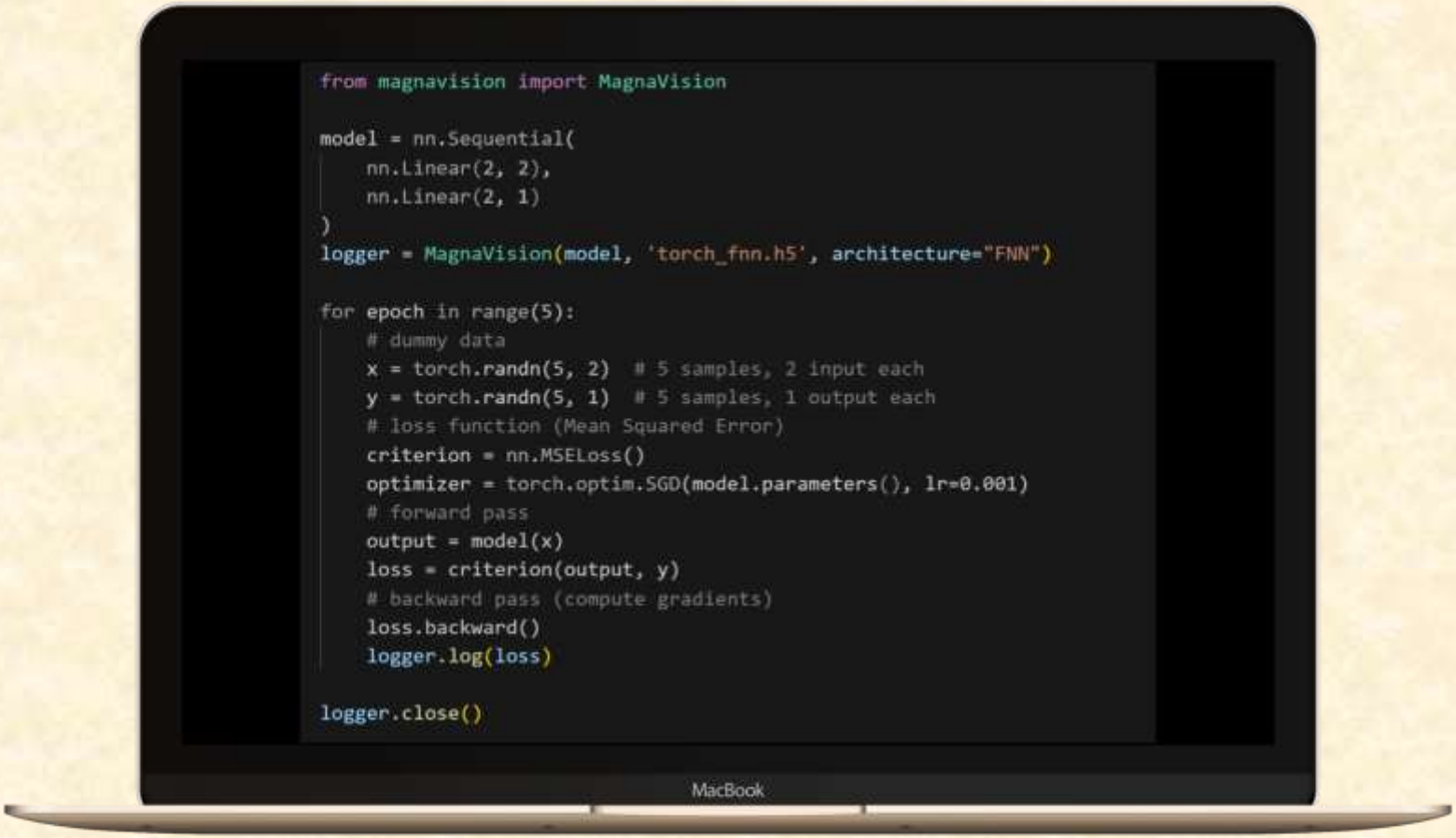
Project Overview

- Develop an interactive UI for visualizing the training of machine learning models
- Various ML models operate as “black boxes” and our software allows a better understanding of the behind the scenes of these models
- Engineers working with all types of machine learning will use our service to debug and understand their models better

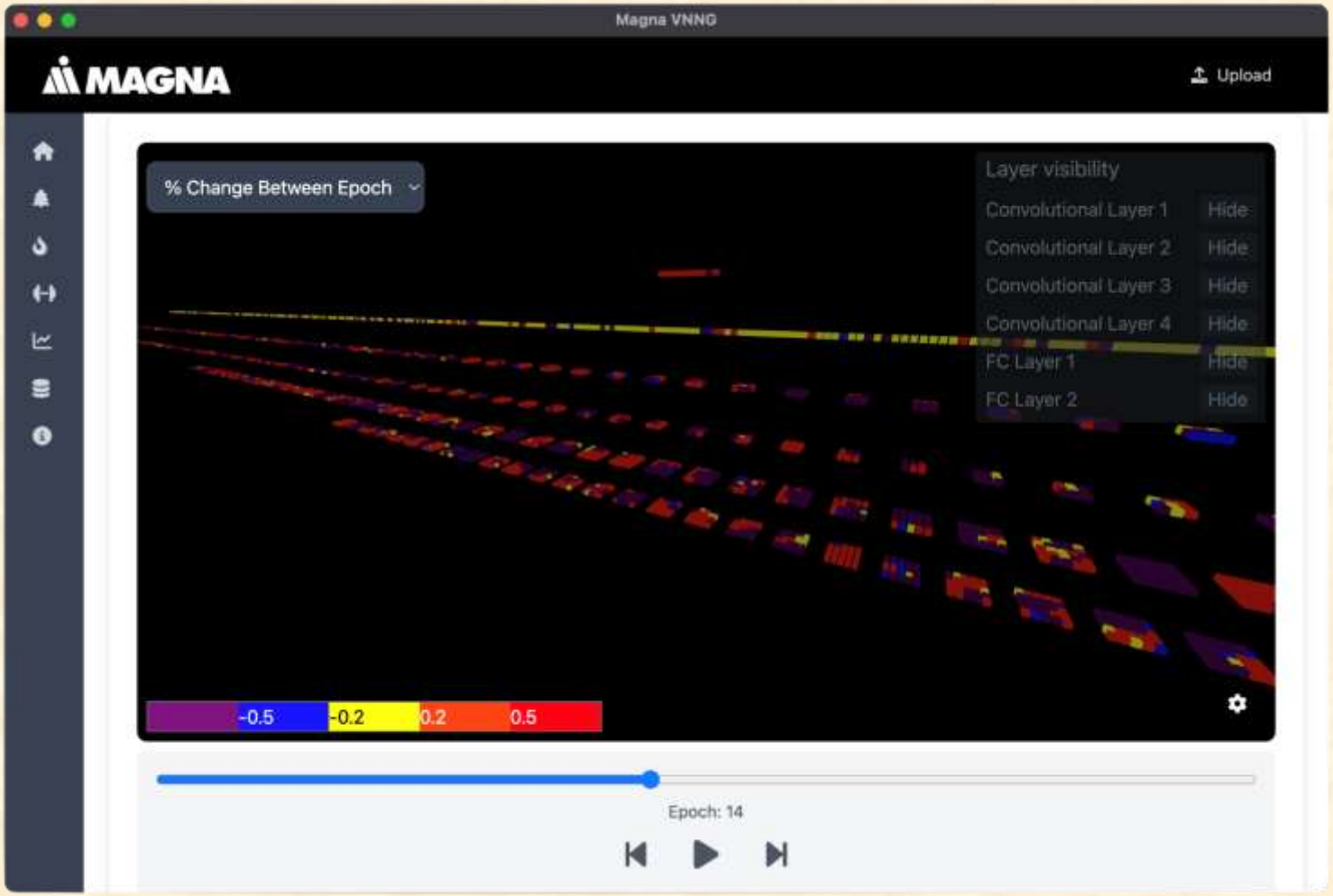
System Architecture



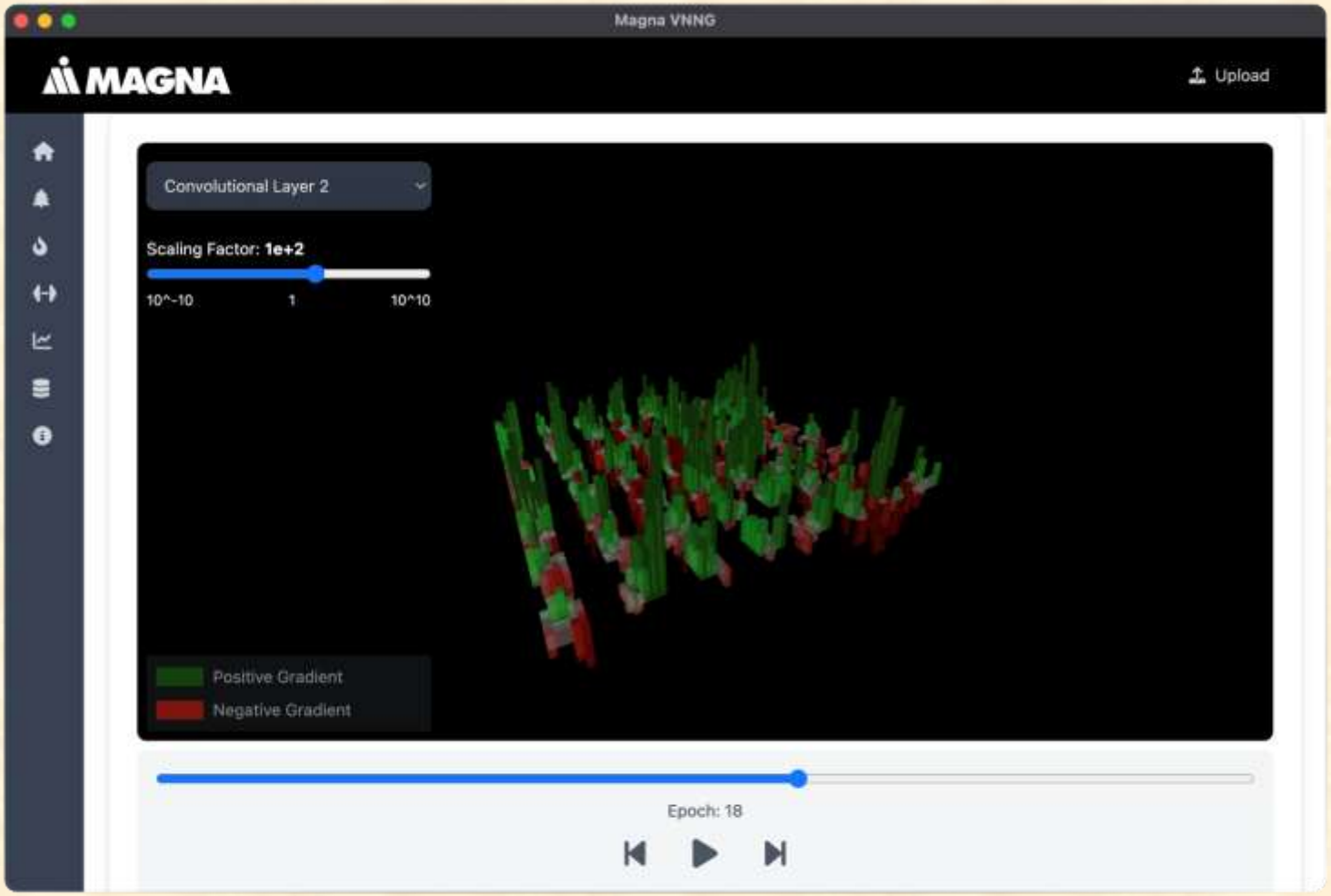
Library/Logger



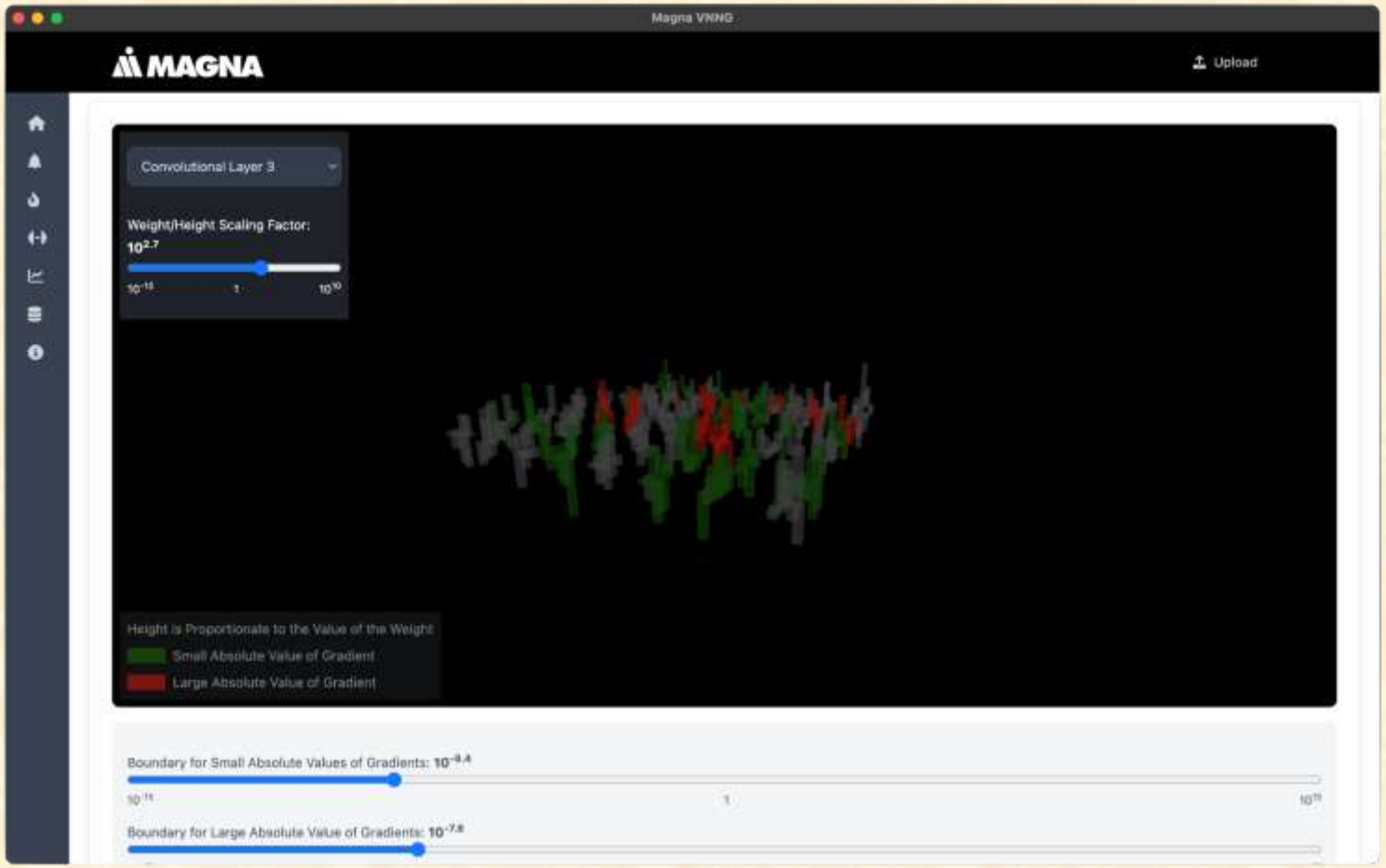
Multilayer


Magna VNNG
MAGNA
Upload
% Change Between Epoch
Layer visibility
Convolutional Layer 1 Hide
Convolutional Layer 2 Hide
Convolutional Layer 3 Hide
Convolutional Layer 4 Hide
FC Layer 1 Hide
FC Layer 2 Hide
-0.5
-0.2
0.2
0.5
Epoch: 14

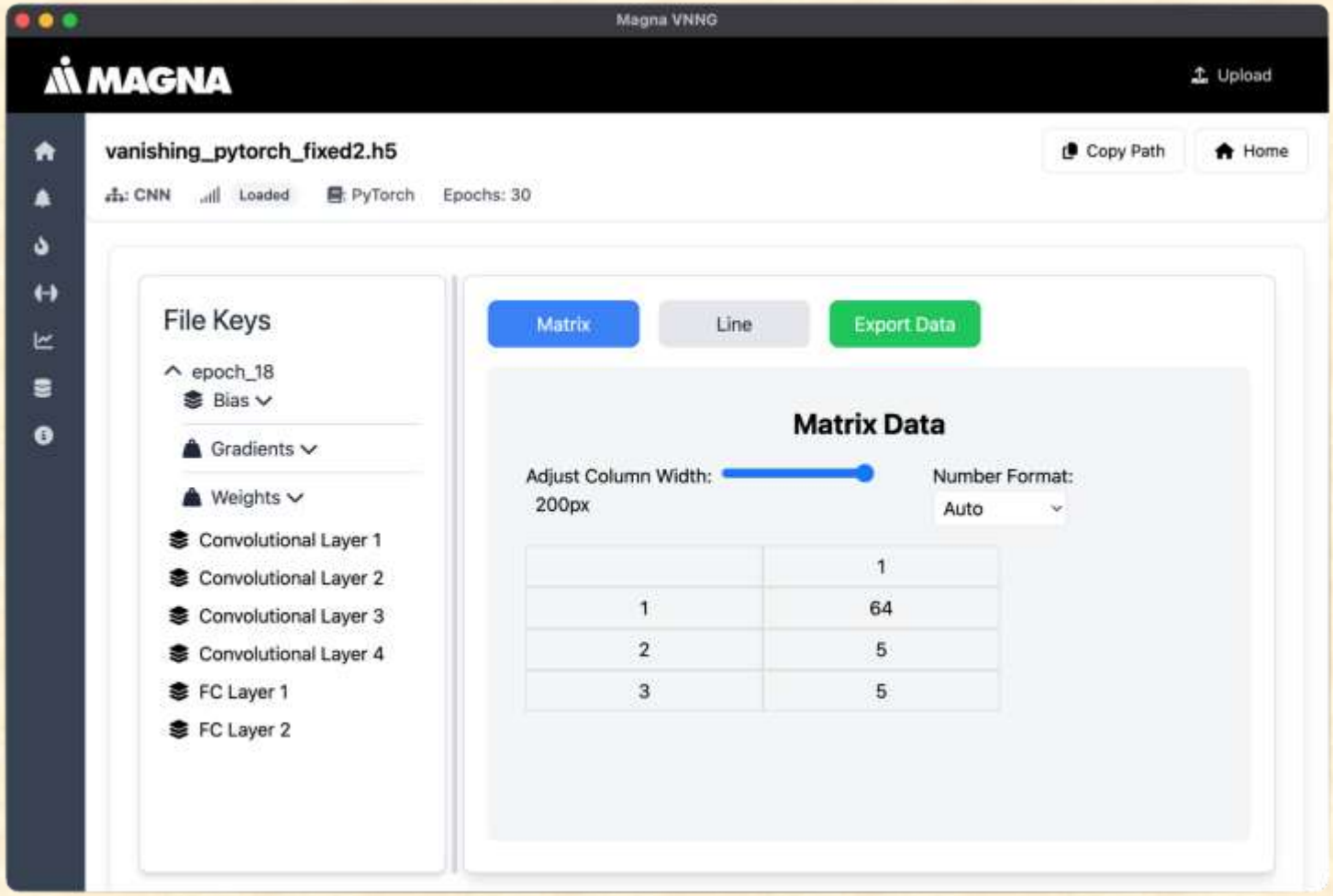
Heatmap


Magna VNNG
MAGNA
Upload
Convolutional Layer 2
Scaling Factor: 1e+2
10^-10
1
10^10
Positive Gradient
Negative Gradient
Epoch: 18

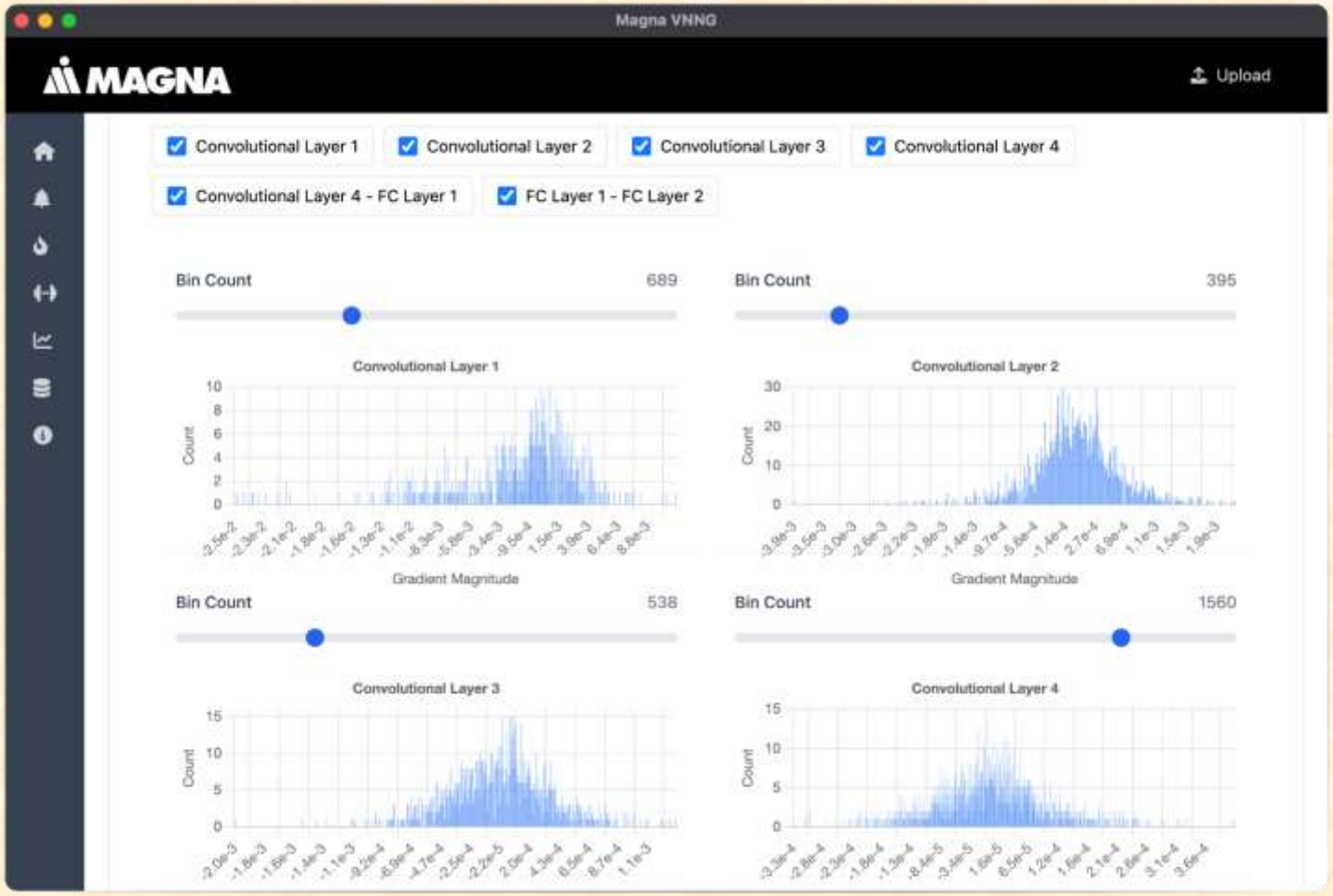
Weight Gradient



Data View


Magna VNNG
MAGNA
Upload
vanishing_pytorch_fixed2.h5
Copy Path
Home
CNN
Loaded
PyTorch
Epochs: 30
File Keys
epoch_18
Bias
Gradients
Weights
Convolutional Layer 1
Convolutional Layer 2
Convolutional Layer 3
Convolutional Layer 4
FC Layer 1
FC Layer 2
Matrix
Line
Export Data
Matrix Data
Adjust Column Width:
200px
Number Format:
Auto
1
1
64
2
5
3
5

Distribution



What's left to do?

- Features
- Stretch Goals
  - Scalability
  - Control System
- Other Tasks
  - Incorporate Feedback from PhD Students
  - Typing Errors
  - Styling
  - Further Testing
  - Detail the Guide
  - Adjust Averaging

Questions?