MICHIGAN STATE UNIVERSITY

Alpha Presentation

ML/AI Pipeline for Condition-Based Maintenance 2.0

The Capstone Experience

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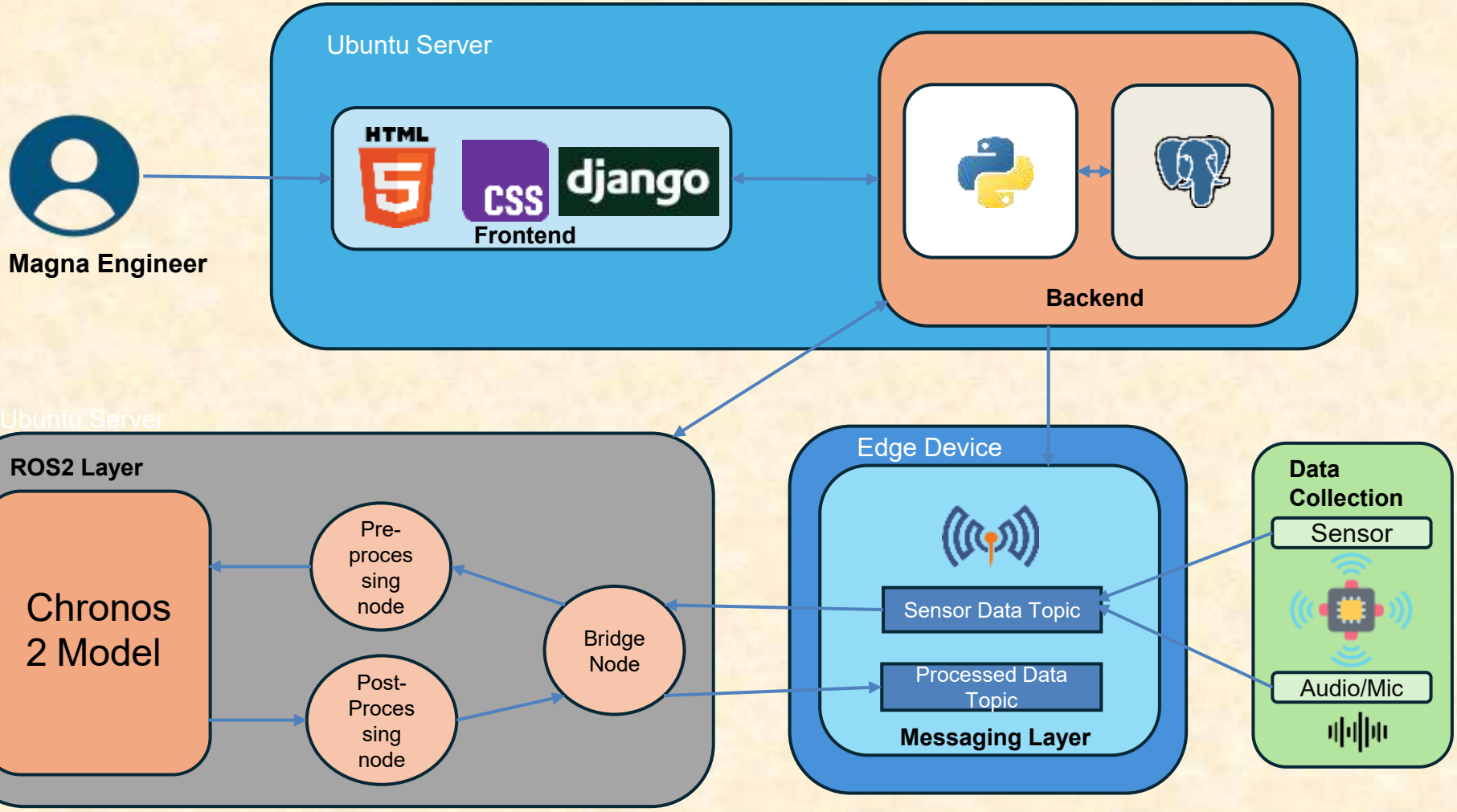


From Students…
…to Professionals

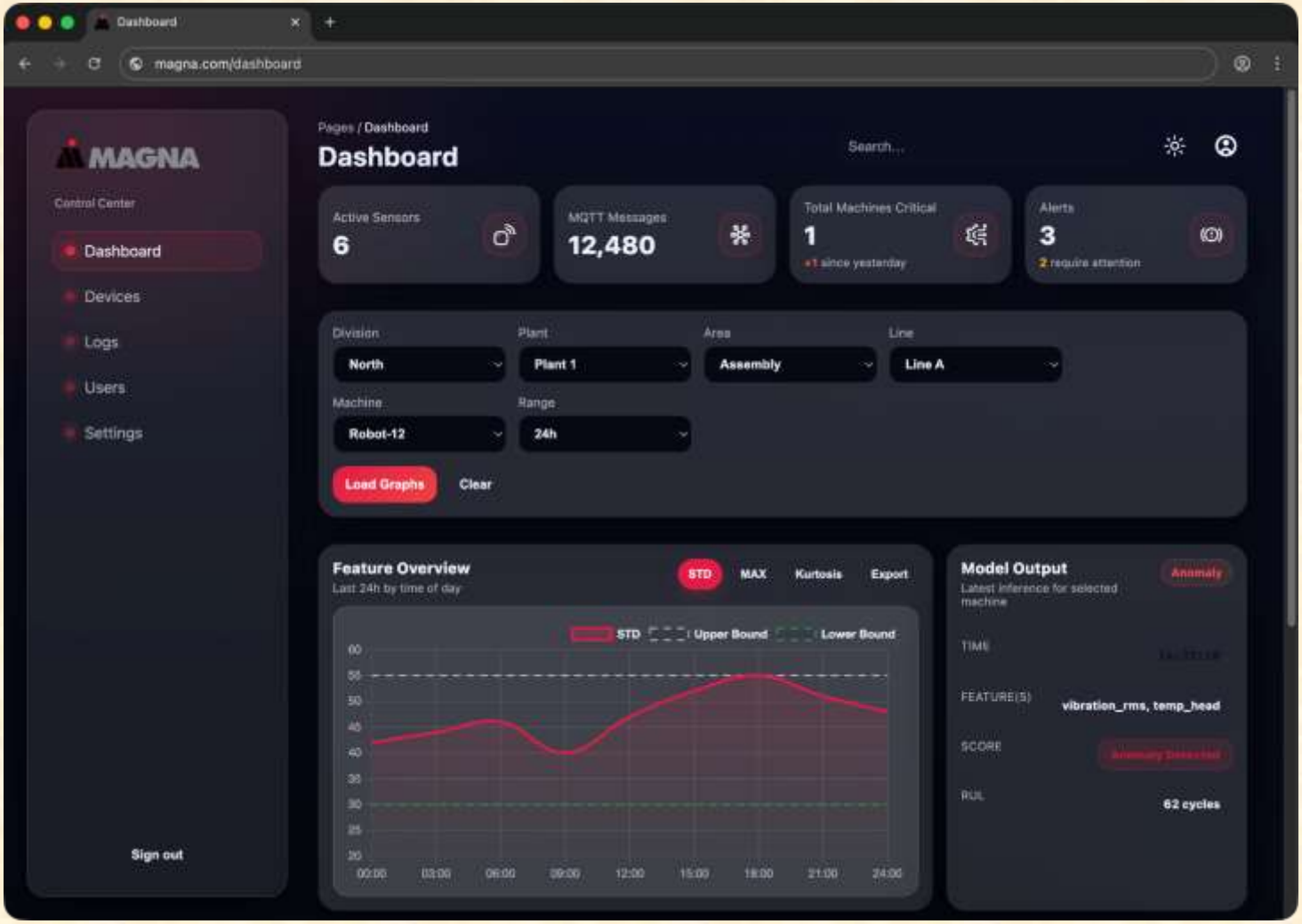
Project Overview

- Unplanned machinery downtime is expensive
- The project uses real sensor readings connected to machinery to predict early warning signals.
- The NVIDIA Jetson is used as a hub to broker connection between the hardware and the software.
- The project implements Chronos 2 model to train and predict the data anomalies.

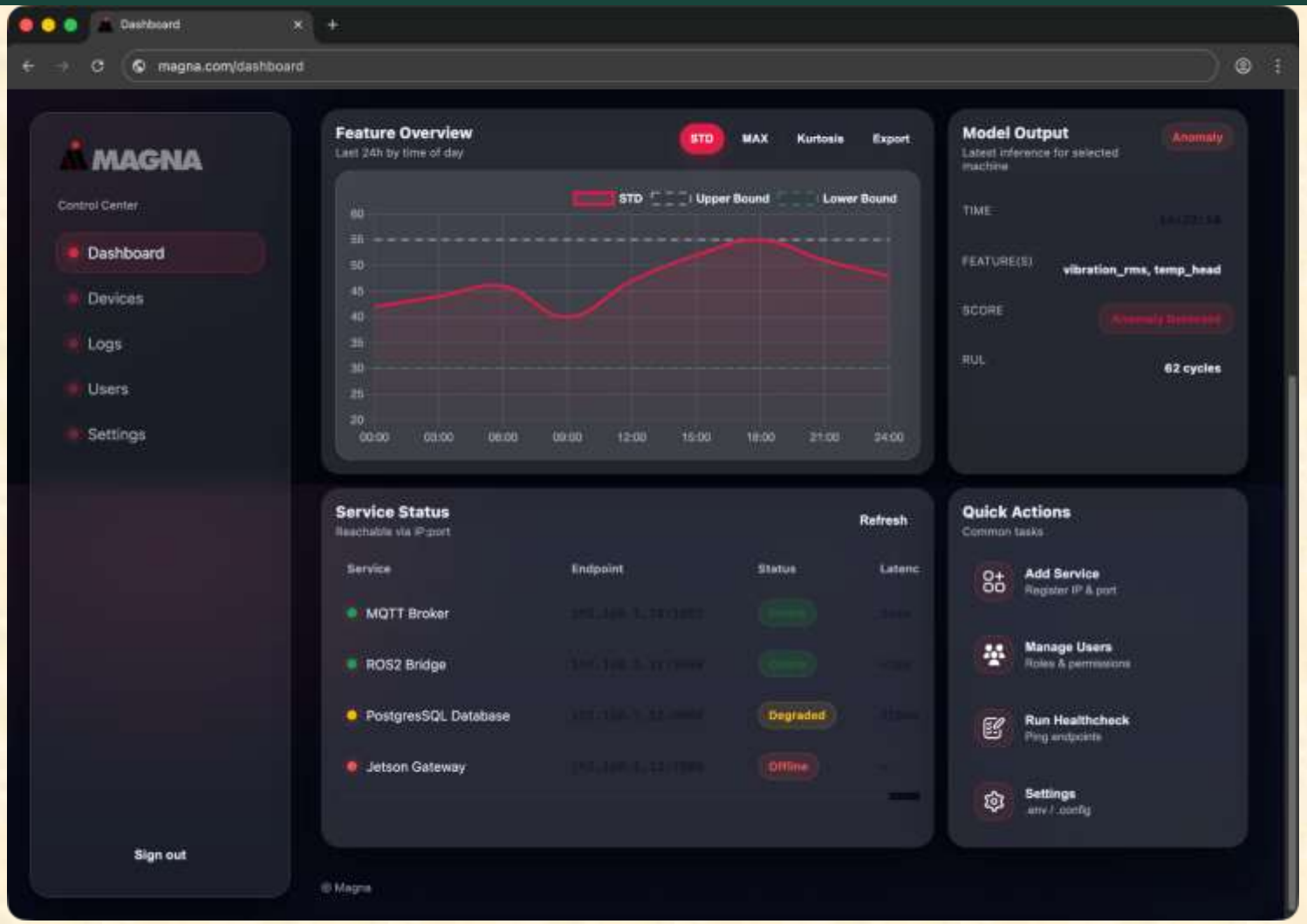
System Architecture



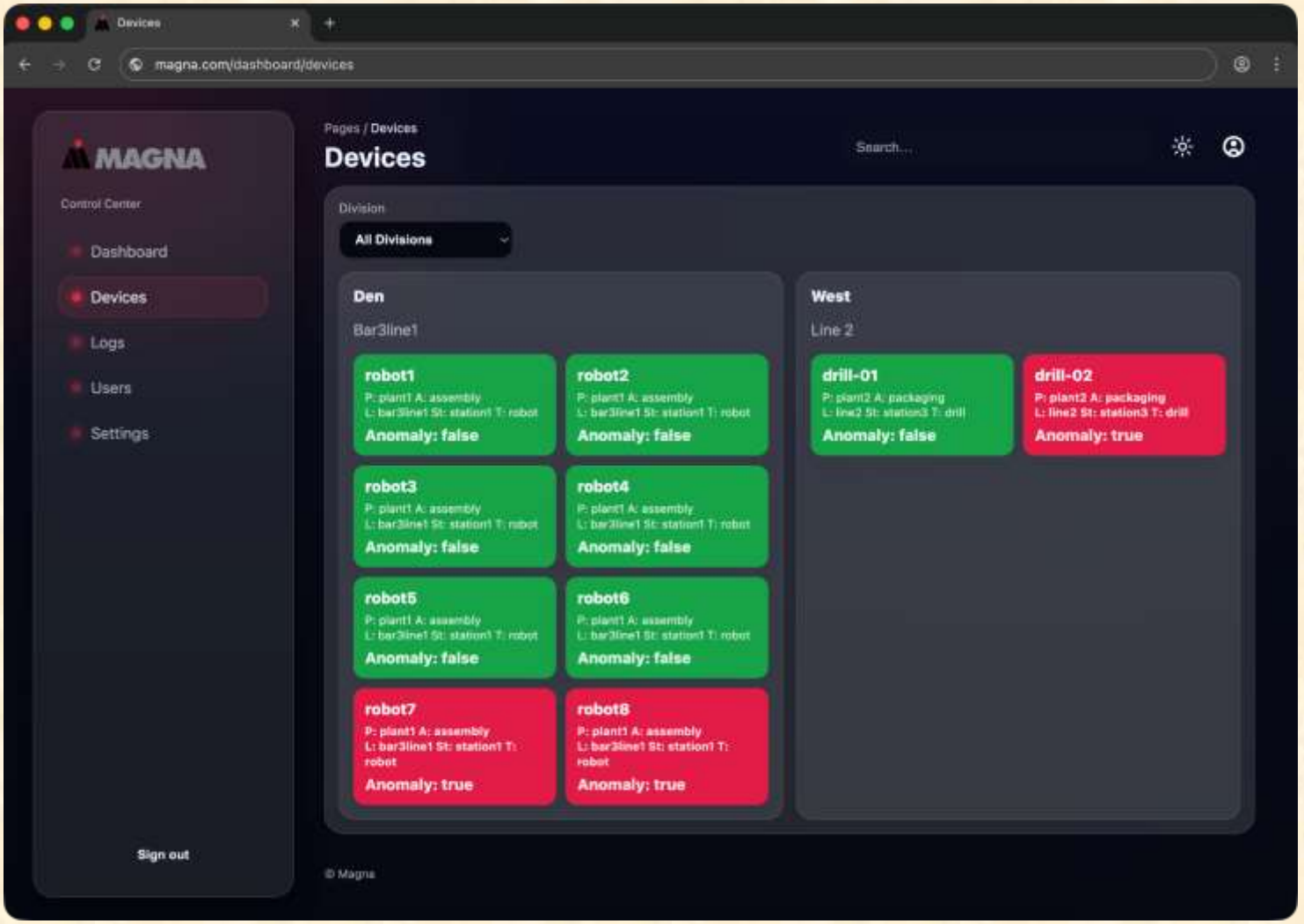
Dashboard


Dashboard
magna.com/dashboard
MAGNA
Control Center
Dashboard
Devices
Logs
Users
Settings
Sign out
Pages / Dashboard
Dashboard
Search...
Active Sensors
6
MQTT Messages
12,480
Total Machines Critical
1
+1 since yesterday
Alerts
3
2 require attention
Division
North
Plant
Plant 1
Area
Assembly
Line
Line A
Machine
Robot-12
Range
24h
Load Graphs
Clear
Feature Overview
Last 24h by time of day
STD
MAX
Kurtosis
Export
STD
Upper Bound
Lower Bound
Model Output
Latest inference for selected machine
Anomaly
TIME
FEATURE(S)
vibration_rms, temp_head
SCORE
RUL
62 cycles

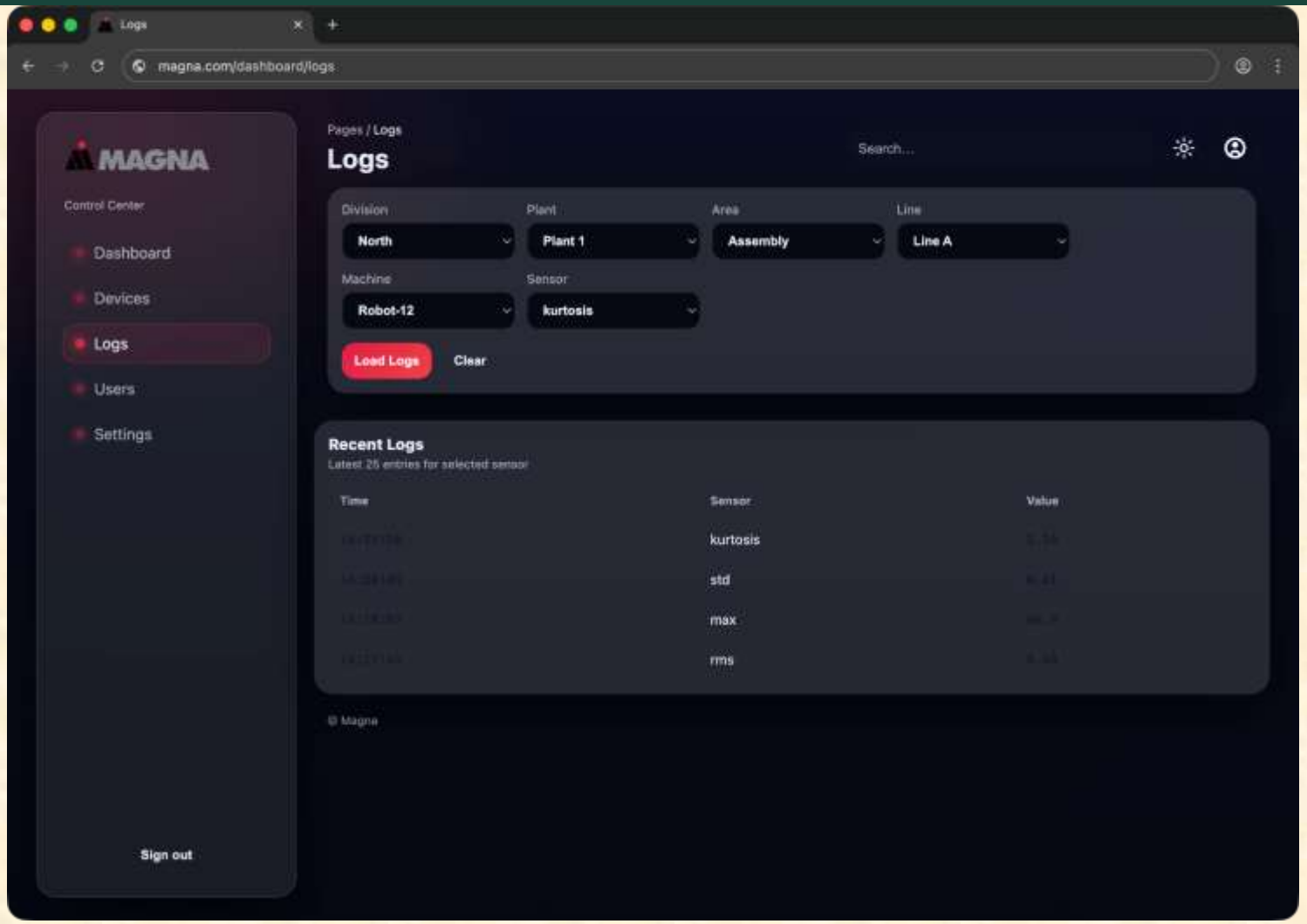
Dashboard (cont.)



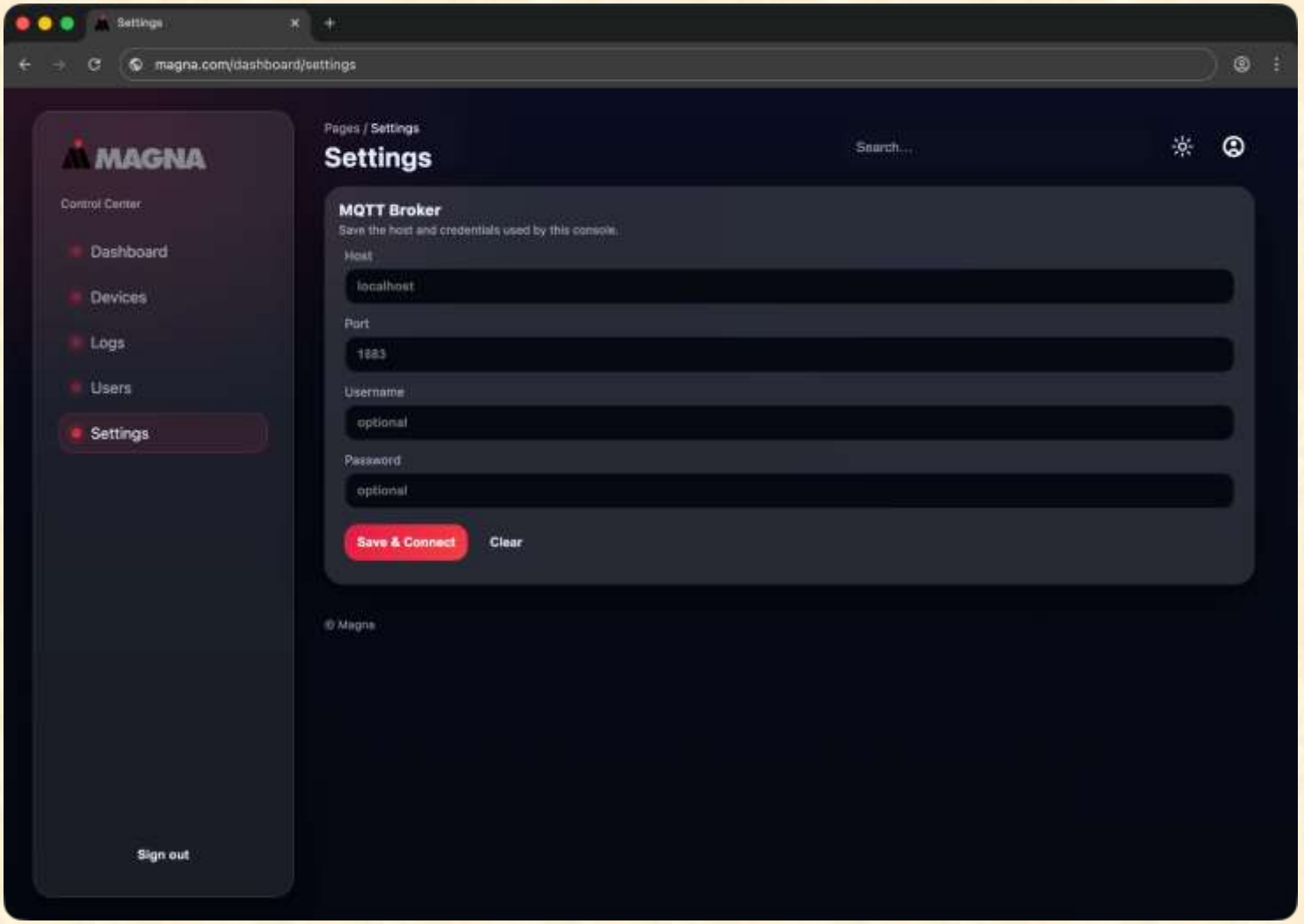
Devices Connected



Logs


Logs
magna.com/dashboard/logs
MAGNA
Control Center
Dashboard
Devices
Logs
Users
Settings
Sign out
Pages / Logs
Logs
Search...
Division
North
Plant
Plant 1
Area
Assembly
Line
Line A
Machine
Robot-12
Sensor
kurtosis
Load Logs
Clear
Recent Logs
Latest 25 entries for selected sensor
Time
Sensor
Value
kurtosis
std
max
rms
© Magna

Settings


Settings
magna.com/dashboard/settings
MAGNA
Control Center
Dashboard
Devices
Logs
Users
Settings
Sign out
Pages / Settings
Settings
Search...
MQTT Broker
Save the host and credentials used by this console.
Host
localhost
Port
1883
Username
optional
Password
optional
Save & Connect
Clear
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What's left to do?

- Configure Raspberry Pi and connect to audio sensor
- Publish continuous and live audio data to HiveMQ
- Train the model with real data
- Connect backend to the UI
- Clean the sensor data and perform feature extraction for the model

Questions?

