

Alpha Presentation

ML/AI Pipeline for Condition-Based Maintenance

The Capstone Experience

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From Students...
...to Professionals

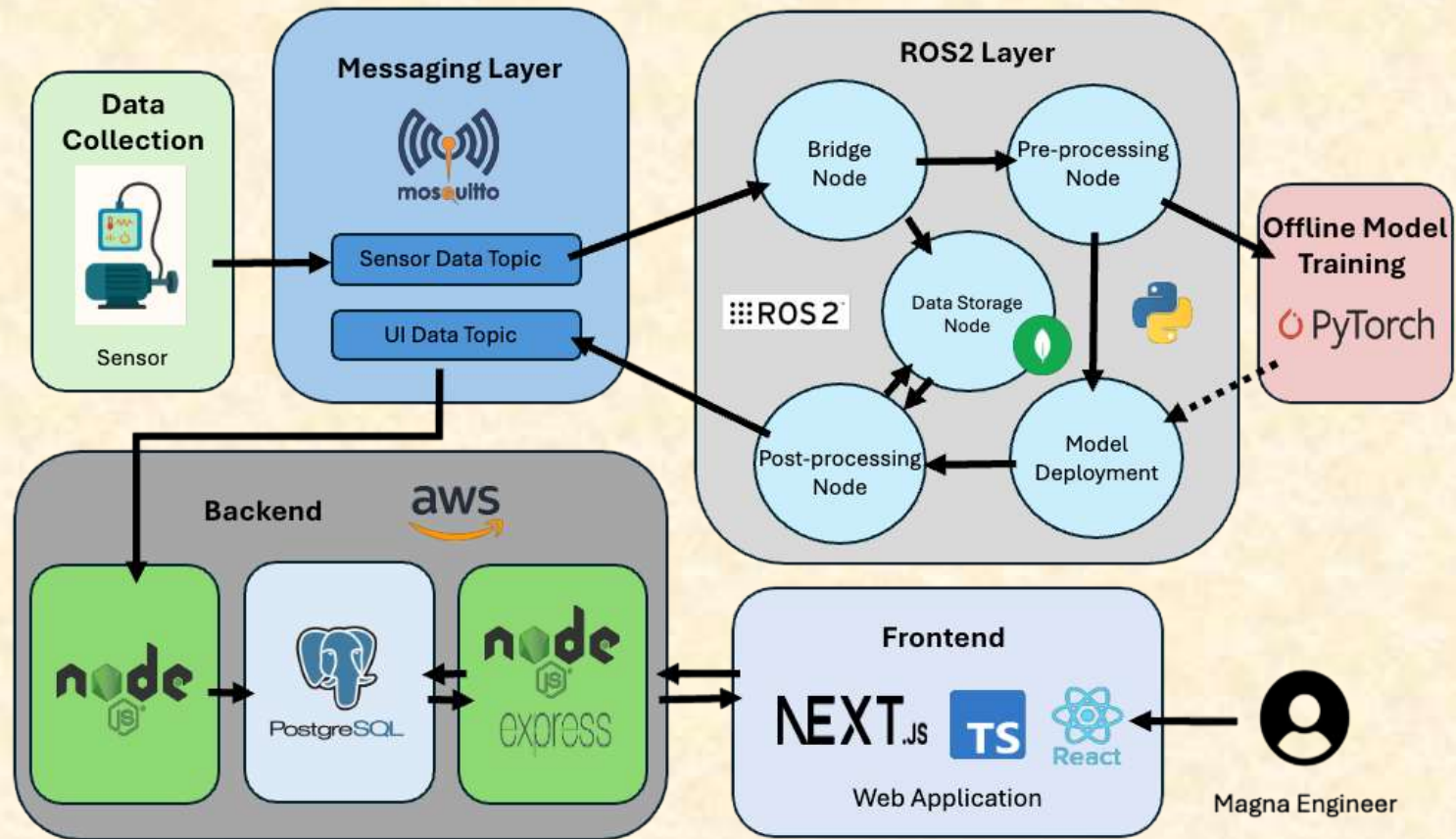
Fall 2025

Project Overview

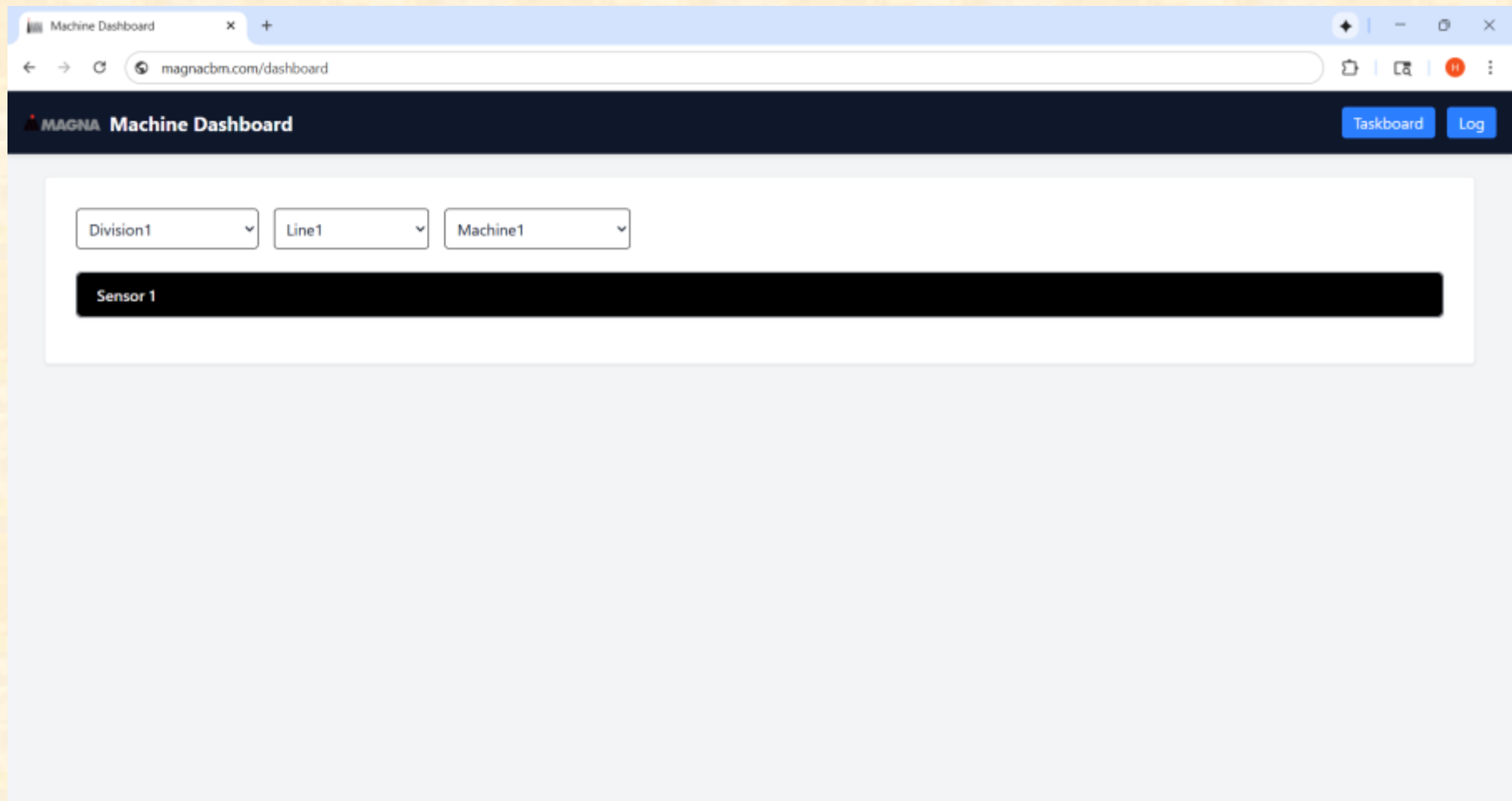
- Unplanned downtime is costly
- Spot anomalies before becoming a problem
- Developed a pipeline to ingest machine diagnostic data
- Intuitive dashboard for monitoring all Magna machinery through live sensor readings and ML model output



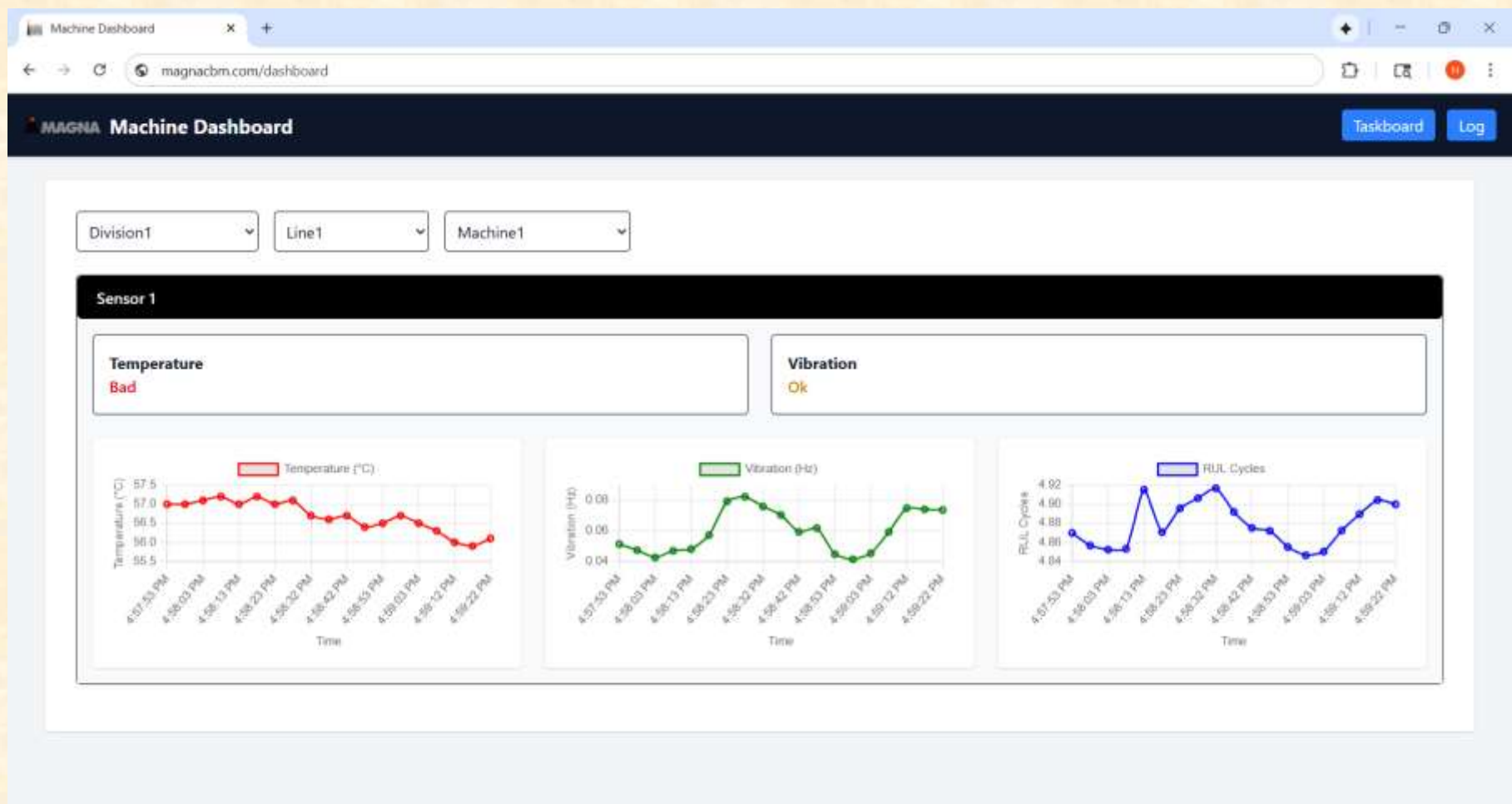
System Architecture



Landing Page



Dashboard



Taskboard

The screenshot displays a web application titled "Machine Taskboard". The browser's address bar shows the URL "magnacbm/taskboard". The application has a dark blue header with the title "Machine Taskboard" and two buttons: "Dashboard" and "Log". Below the header, there is a dropdown menu labeled "All Divisions". The main content area is divided into three columns, each representing a division: "Division1", "Division2", and "Division3". Each division contains two rows of machine status cards, labeled "Line1" and "Line2". Each card displays the machine number, its status (Risky, Good, or Critical), and its Risk Level (RUL). The cards are color-coded: yellow for Risky, green for Good, and red for Critical.

Division	Line	Machine	Status	RUL
Division1	Line1	Machine 1	Risky	4
		Machine 2	Good	5
		Machine 3	Good	5
		Machine 4	Critical	2
	Line2	Machine 5	Critical	1
		Machine 6	Critical	0
		Machine 7	Critical	2
		Machine 8	Risky	3
Division2	Line1	Machine 9	Risky	4
		Machine 10	Good	7
		Machine 11	Good	6
		Machine 12	Good	5
	Line2	Machine 13	Critical	1
		Machine 14	Risky	4
		Machine 15	Risky	3
		Machine 16	Good	5
Division3	Line1	Machine 17	Critical	2
		Machine 18	Risky	4
		Machine 19	Good	5
		Machine 20	Risky	4
	Line2	Machine 21	Good	5
		Machine 22	Risky	3
		Machine 23	Critical	0
		Machine 24	Risky	4



Log View

Machine Dashboard

magnacbm.com/log

Machine Log

Dashboard Taskboard

Division1 Line1 Machine 1

Timestamp	Temperature	Vibration	Machine ID	RUL Cycles	Confidence
2025-10-08T21:04:58.620Z	57.8	0.0612	Machine1	4.8619256	0.9872561
2025-10-08T21:04:53.620Z	57.9	0.04	Machine1	4.840852	0.9875204
2025-10-08T21:04:47.620Z	57.8	0.0383	Machine1	4.843732	0.96048427
2025-10-08T21:04:42.620Z	57.6	0.0502	Machine1	4.867044	0.9606312
2025-10-08T21:04:38.620Z	57.8	0.0593	Machine1	4.9462433	0.96055824
2025-10-08T21:04:33.620Z	57.7	0.0627	Machine1	4.884274	0.959923
2025-10-08T21:04:28.620Z	57.5	11330.936	Machine1	5.06464	0.9599132
2025-10-08T21:04:23.620Z	57	0.078	Machine1	4.906194	0.9602617
2025-10-08T21:04:17.620Z	56.8	0.0853	Machine1	4.9104633	0.9603484
2025-10-08T21:04:13.620Z	56.6	0.0678	Machine1	4.886362	0.96034014
2025-10-08T21:04:08.620Z	56.5	0.054	Machine1	4.892343	0.96032244
2025-10-08T21:04:03.620Z	56.2	6327.5024	Machine1	5.5378094	0.9601471
2025-10-08T21:03:58.620Z	55.8	0.042	Machine1	4.854505	0.99507964
2025-10-08T21:03:53.620Z	55.8	0.0481	Machine1	4.8610377	0.99520004



What's left to do?

- Continue improvement of model training
- Fine tuning efficiency of pipeline
- Create system for connecting to different brokers
- UI improvement
- Stretch goal: mobile version of dashboard

Questions?

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