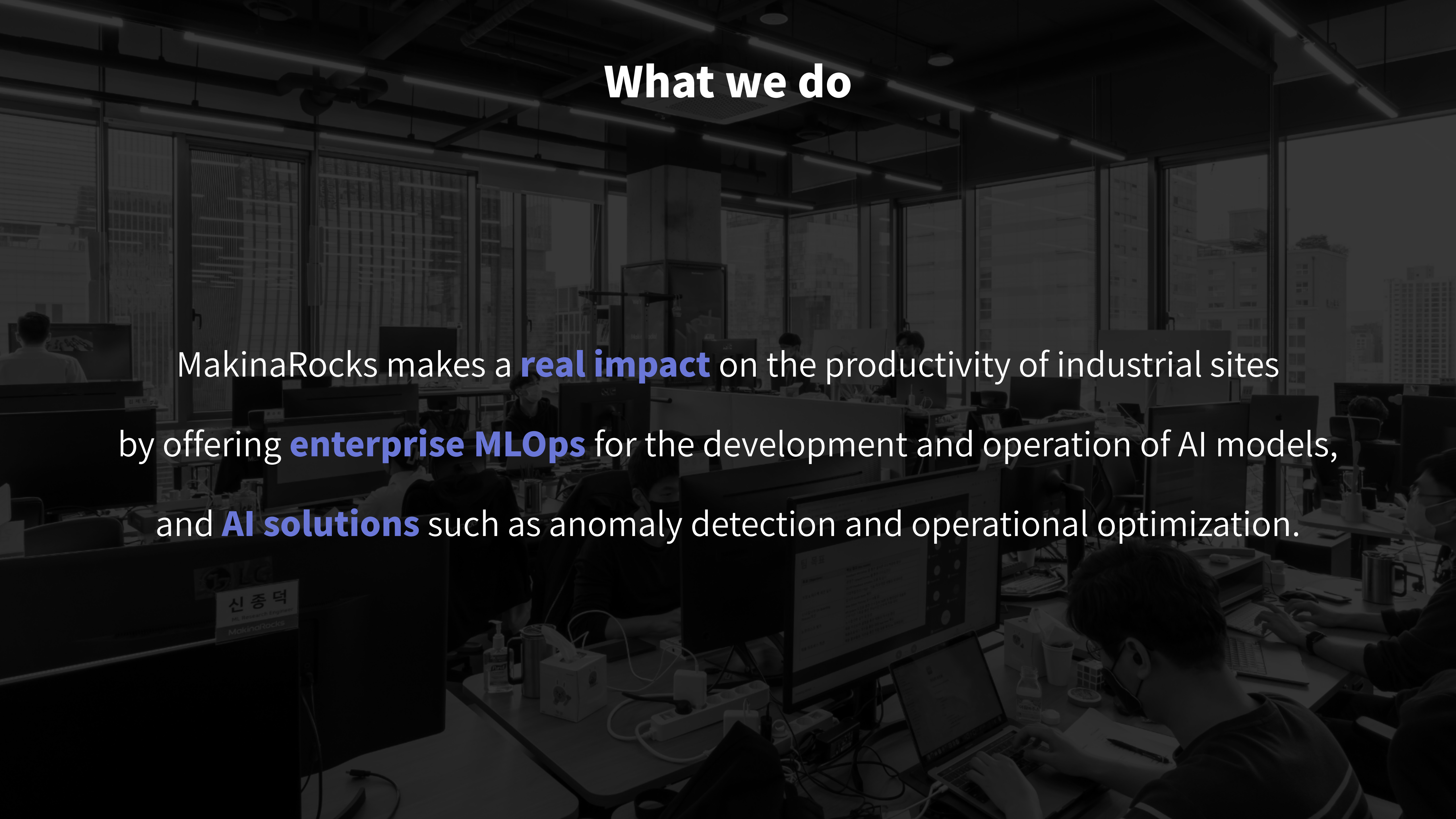
MakinaRocks



What we do

MakinaRocks makes a **real impact** on the productivity of industrial sites by offering **enterprise MLOps** for the development and operation of AI models, and **AI solutions** such as anomaly detection and operational optimization.

What makes our enterprise MLOps different?

Optimized for industrial AI operations

Ease of use

Intuitive MLOps system tailored to data scientists

Faster iteration and higher productivity

Seamless transition from model development to deployment and vice versa

Suitable for varying industrial environments

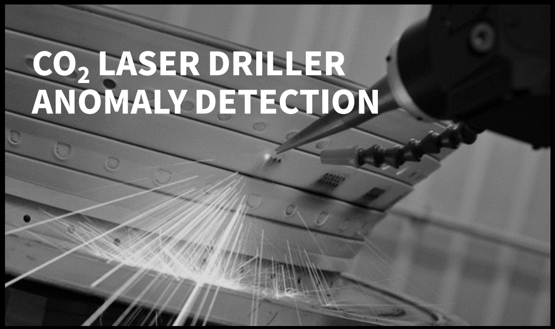
- Edge, on-premise, cloud, and hybrid
- Model deployment and retraining orchestration for edge devices

Overcoming a wide range of industrial challenges with AI

Click: webpage

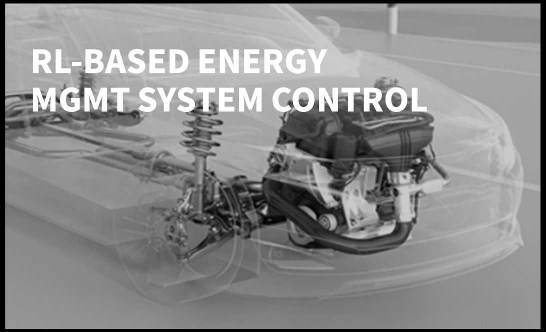
SEMICON EQUIPMENT TIME-TO-FAILURE

ROBOT ARM ANOMALY DETECTION

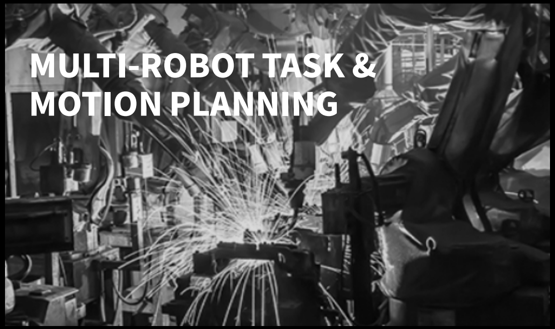


CO_2 LASER DRILLER ANOMALY DETECTION

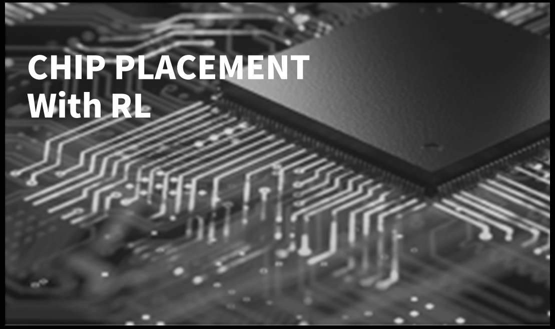
Li+ BATTERY ESS ANOMALY DETECTION



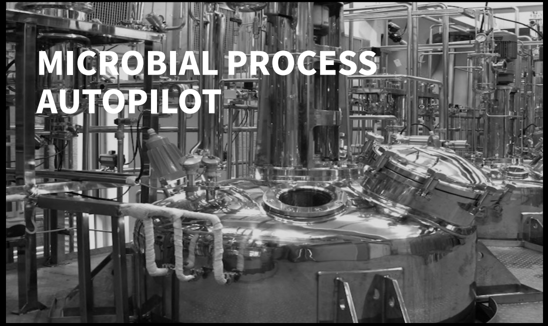
RL-BASED ENERGY MGMT SYSTEM CONTROL



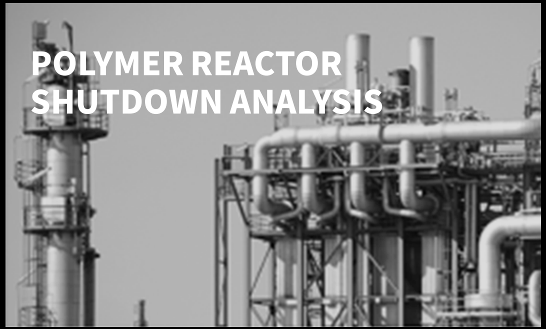
MULTI-ROBOT TASK & MOTION PLANNING



CHIP PLACEMENT With RL

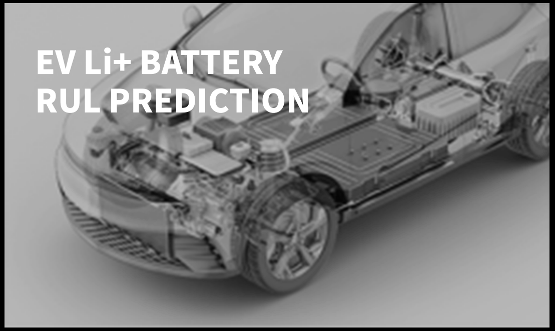


MICROBIAL PROCESS AUTOPILOT



POLYMER REACTOR SHUTDOWN ANALYSIS

SOLAR POWER GENERATION PREDICTION



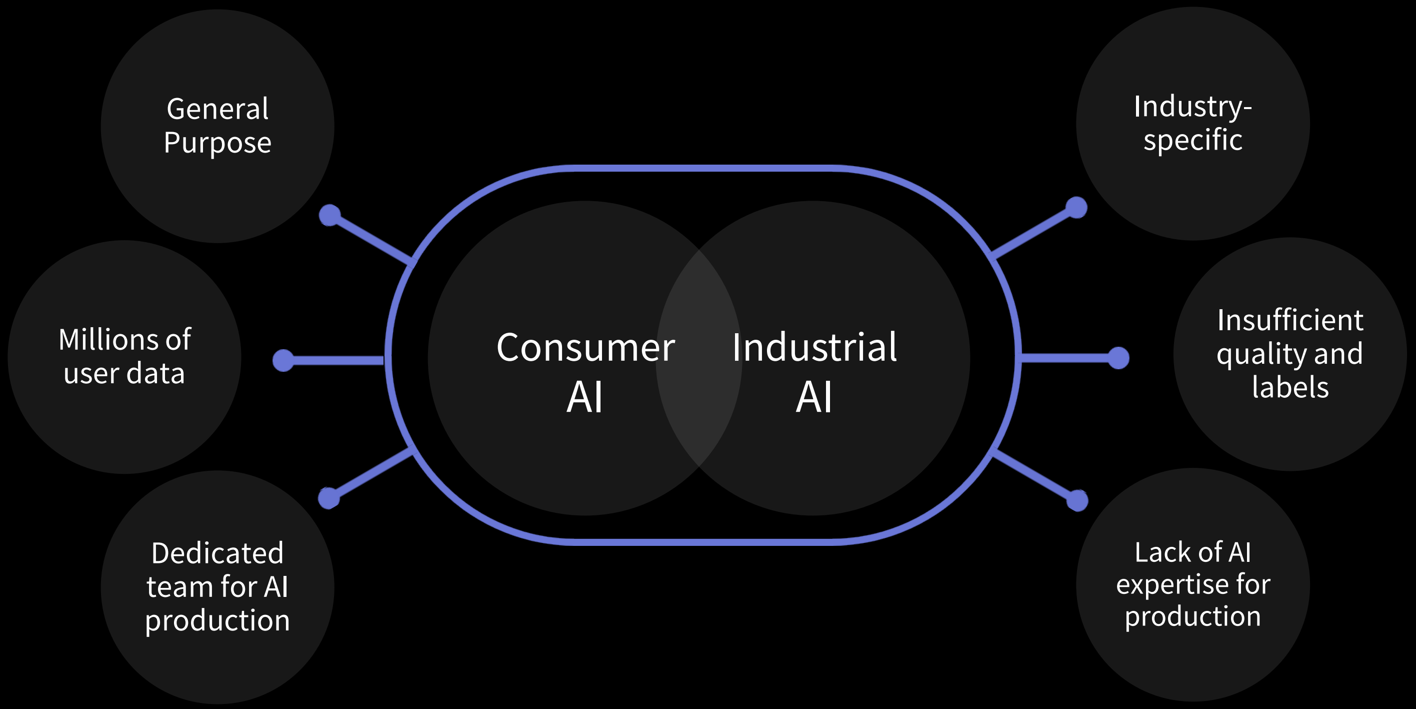
EV Li+ BATTERY RUL PREDICTION

VENTILATION SYSTEMS ANOMALY DETECTION

APPLIED MATERIALS · HYUNDAI · KIA · LG AI Research · SK on · SK telecom · HYUNDAI ROBOTICS · Hanon SYSTEMS · Mando · GS Caltex

Why is it so difficult to adopt AI in industrial sectors?

AI in consumer software vs. AI in industrial


General Purpose
Millions of user data
Dedicated team for AI production
Consumer AI
Industrial AI
Industry-specific
Insufficient quality and labels
Lack of AI expertise for production

Challenges

Cost of customization
bespoke solutions

Small datasets
c.f., anomaly detection

PoC & production gap
long time to deployment

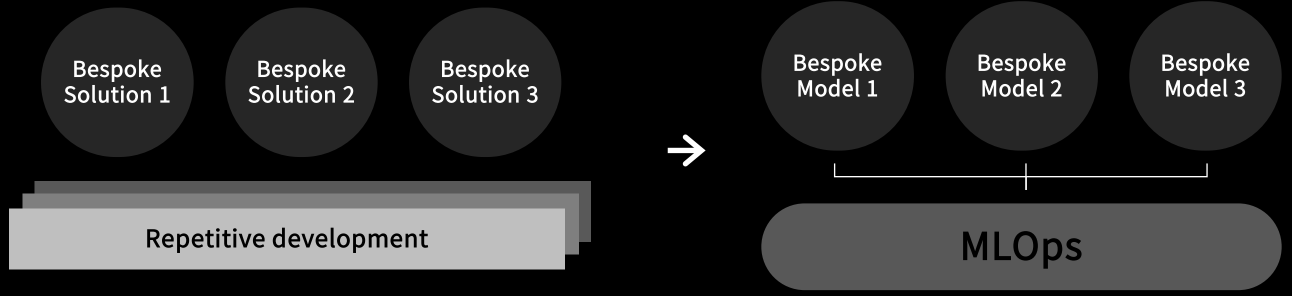
AI Doesn’t Have to Be Too Complicated or Expensive for Your Business (Harvard Business Review, 2021)

How are we overcoming these challenges?

Challenges | **Our Approach**

Cost of customization ▶

Building and re-using "Common Parts" with MLOps

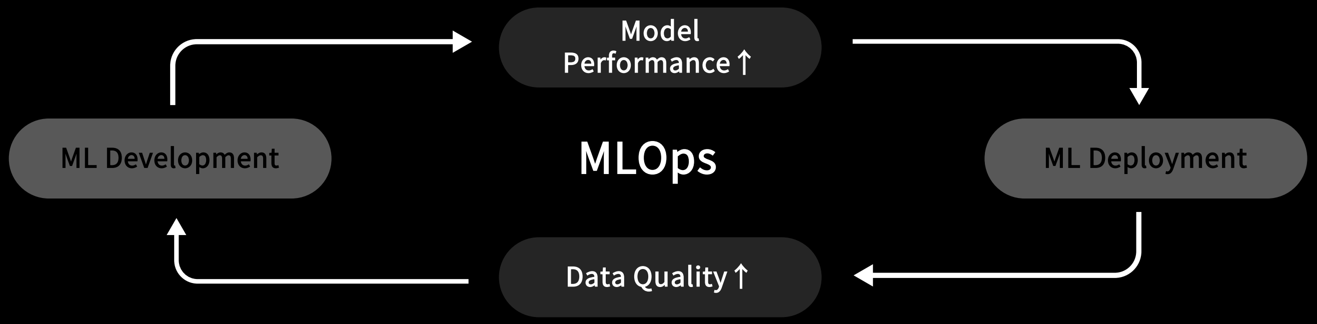


Development Efficiency ↑ Reusability ↑ Robustness ↑

Small datasets

PoC & production gap ▶

Integrated model development and deployment



Iteration Frequency ↑ Data Quality ↑ Model Performance ↑

Our Enterprise MLOps for Industrial Applications

Lifecycle management of machine learning development and operation

ML Model Development

ML Model Operation

Accelerating the ML model development cycle

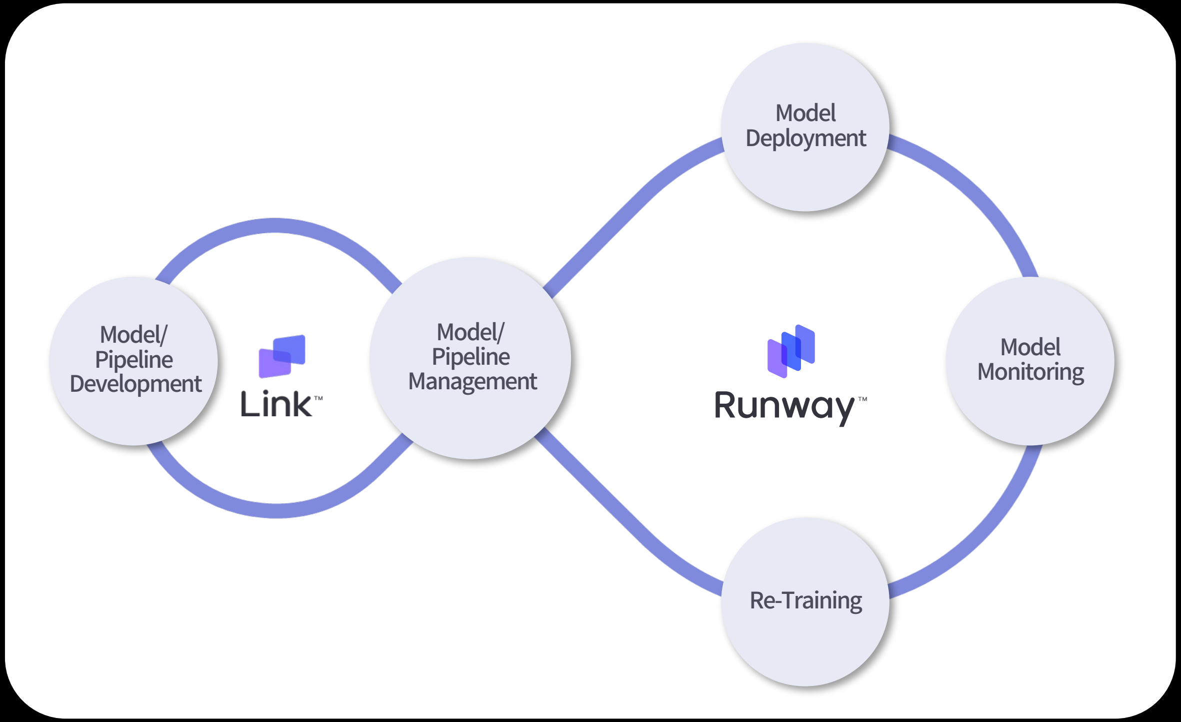
- One click to production and one click back to modeling

Efficient and effective collaboration

- Tracking differences, merging changes, and annotating for ML pipelines

JupyterLab based development platform

- Familiar, convenient and capable environment for data exploration and experiments



Versatile operation modes

- Serving batch, streaming, and REST API requests

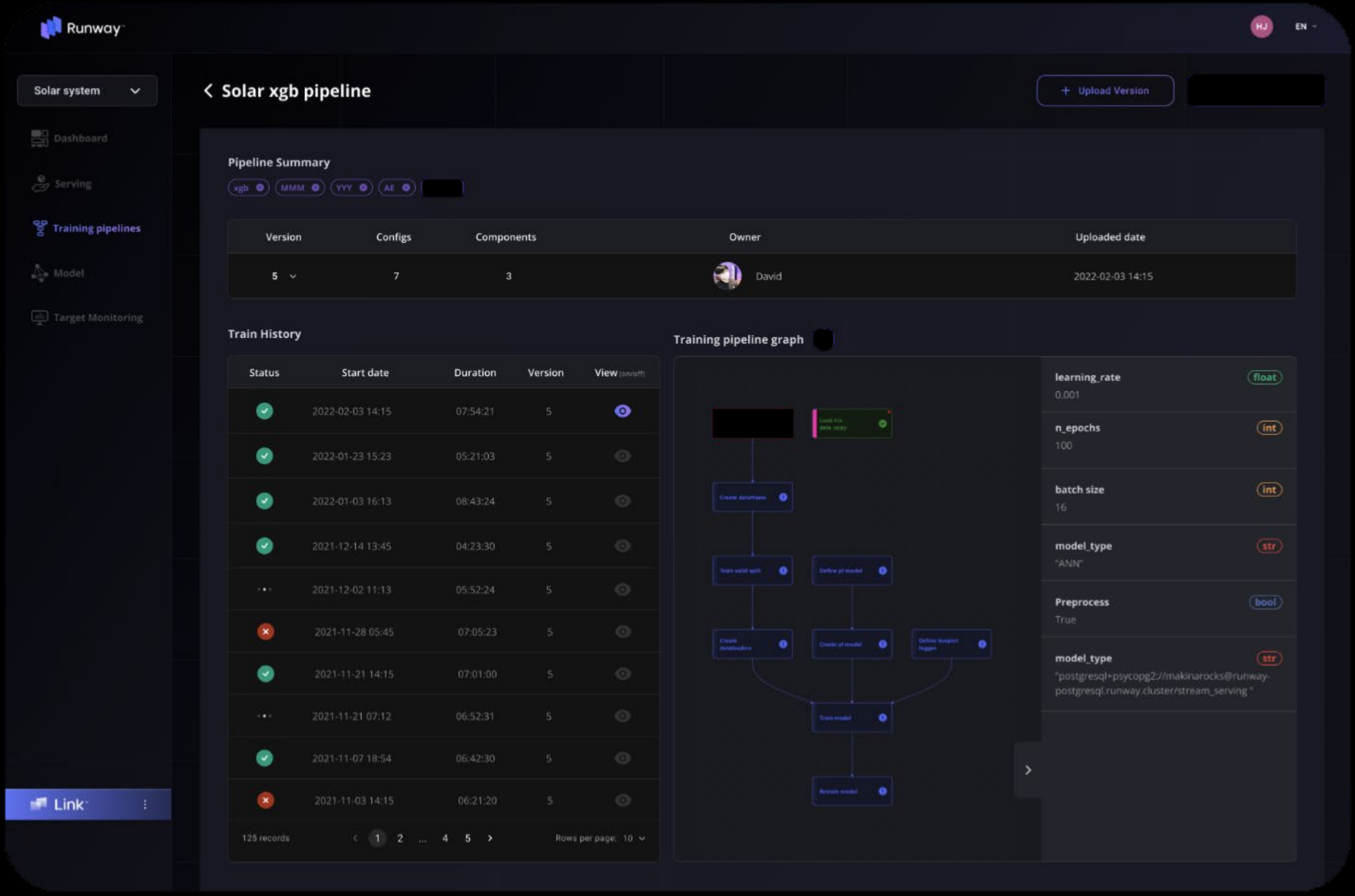
Continual learning

- Retraining and updating models automatically with customizable trigger conditions

From edge to cloud

- Configurable for use with edge, on-premise, cloud, or hybrid environments

Runway™



[redacted]

Solar xgb pipeline

Pipeline Summary

xgb MMM YYY AE [redacted]

Version	Configs	Components	Owner	Uploaded date
5	7	3	David	2022-02-03 14:15

Train History

Status	Start date	Duration	Version	View (on/off)
✓	2022-02-03 14:15	07:54:21	5	●
✓	2022-01-23 15:23	05:21:03	5	○
✓	2022-01-03 16:13	08:43:24	5	○
✓	2021-12-14 13:45	04:23:30	5	○
•••	2021-12-02 11:13	05:52:24	5	○
✗	2021-11-28 05:45	07:05:23	5	○
✓	2021-11-21 14:15	07:01:00	5	○
•••	2021-11-21 07:12	06:52:31	5	○
✓	2021-11-07 18:54	06:42:30	5	○
✗	2021-11-03 14:15	06:21:20	5	○

125 records ‹ 1 2 ... 4 5 › Rows per page: 10

Training pipeline graph [redacted]

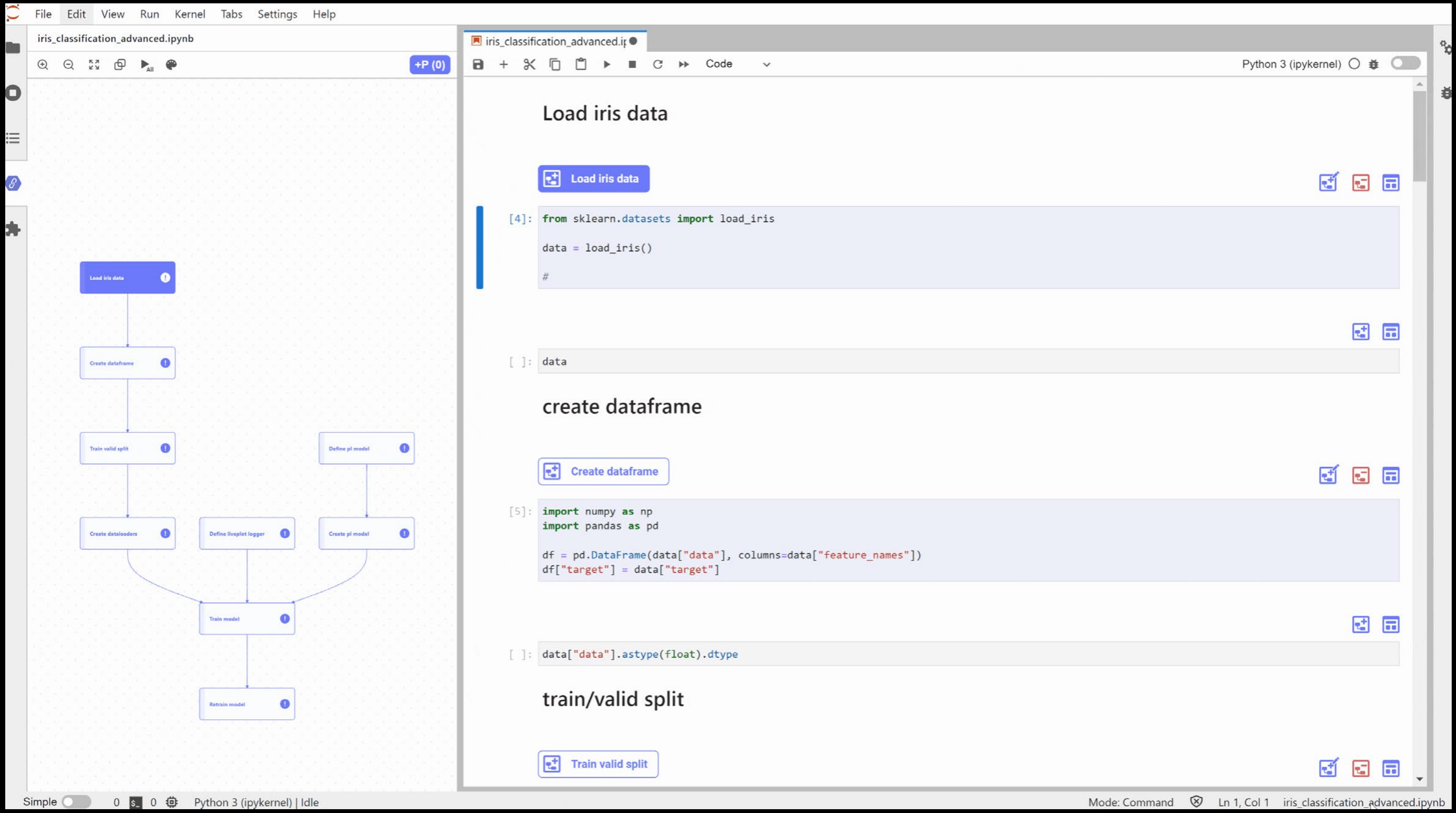
[redacted]

learning_rate	0.001	float
n_epochs	100	int
batch size	16	int
model_type	"ANN"	str
Preprocess	True	bool
model_type	"postgresql+psycopg2://makinarocks@runway-postgresql.runway.cluster/stream_serving "	str

Runway™ is a full-fledged, manufacturing-focused MLOps platform.

- Automate model retraining and updates with A/B testing.
- Measure model performance and system health with readily available metrics.
- Manage multiple projects intuitively.
- Provide batch, streaming, and API-based serving method to handle multiple data sources and inference requirements.
- Easily configure model deployment, retraining, and inferences to accommodate complex edge device layouts.

Link™



Load iris data

Load iris data

```
[4]: from sklearn.datasets import load_iris

     data = load_iris()

     #
```

```
[ ]: data
```

create dataframe

Create dataframe

```
[5]: import numpy as np
     import pandas as pd

     df = pd.DataFrame(data["data"], columns=data["feature_names"])
     df["target"] = data["target"]
```

```
[ ]: data["data"].astype(float).dtype
```

train/valid split

Train valid split

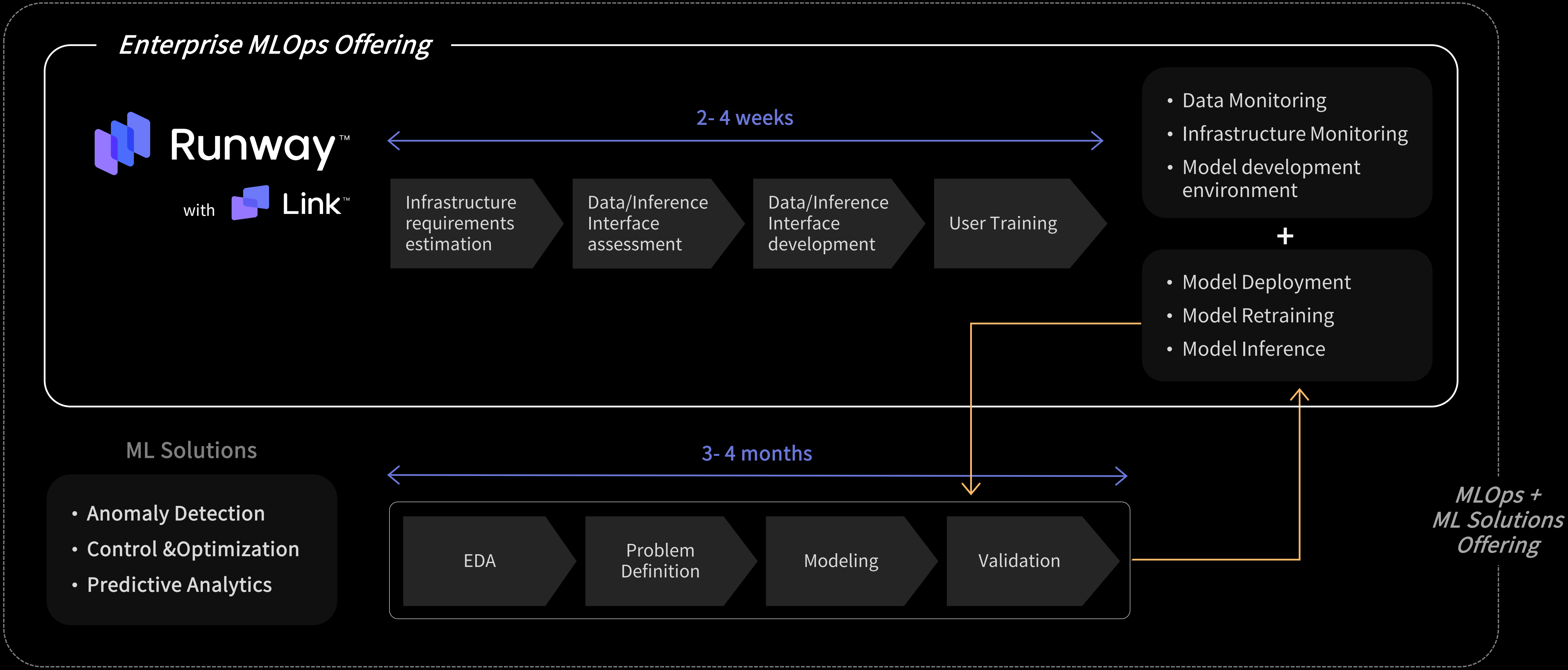
https://link.makinarocks.ai

The Link™ modeling environment is a key component of our MLOps.

- Design, run, and verify model training pipelines directly in Jupyter notebook.
- Avoid unnecessary re-execution by automatic component caching.
- Convert/export pipelines to operational environments without rewriting them.
- Manage and collaborate on pipelines using the git version control system.
- Annotate pipelines with color tags and comments.

Our Offering

Enterprise MLOps software and industrial-specific ML solutions



Enterprise MLOps Offering

Runway™ with Link™

2- 4 weeks

Infrastructure requirements estimation → Data/Inference Interface assessment → Data/Inference Interface development → User Training

- Data Monitoring
- Infrastructure Monitoring
- Model development environment

+

- Model Deployment
- Model Retraining
- Model Inference

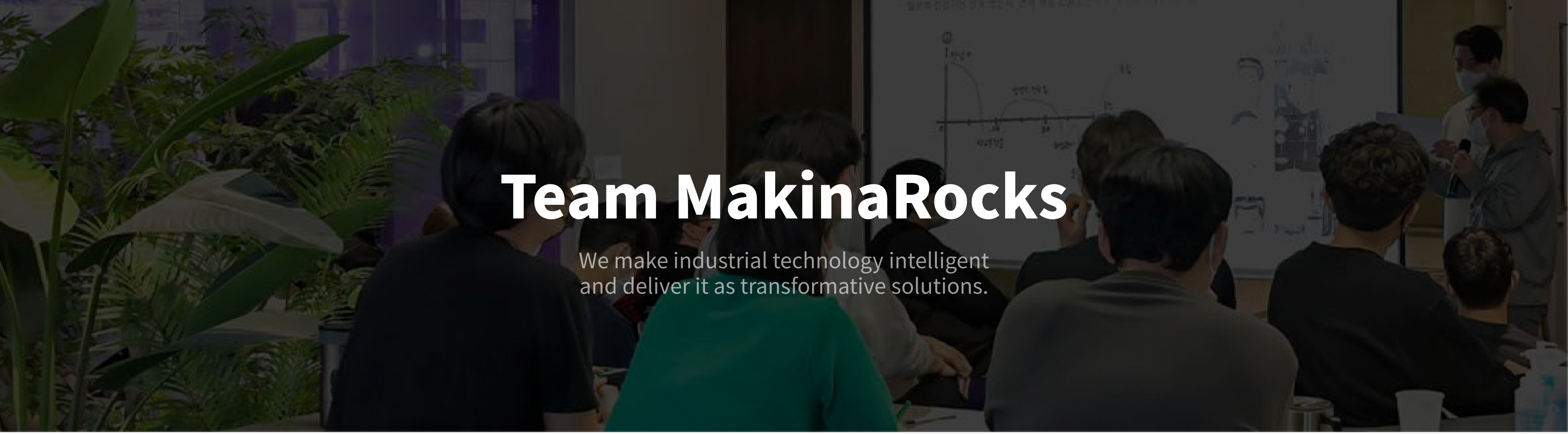
ML Solutions

- Anomaly Detection
- Control &Optimization
- Predictive Analytics

3- 4 months

EDA → Problem Definition → Modeling → Validation

MLOps + ML Solutions Offering



Team MakinaRocks

We make industrial technology intelligent
and deliver it as transformative solutions.

70+

Members in Korea and
Silicon Valley

$12M+ (Series A)

Raised from prestigious global investors

SK telecom NAVER HYUNDAI APPLIED MATERIALS KDB Bank
DAESUNG PRIVATE EQUITY Shinhan Bank HB INVESTMENT LG

Top 100

Tech. Pioneer company selected
By World Economic Forum(WEF)

6+

Opensource projects
we are actively contributing to

Katib MOVEit argo RAY Kubeflow CORE

1K+

# of AI model
currently being served

MakinaRocks

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