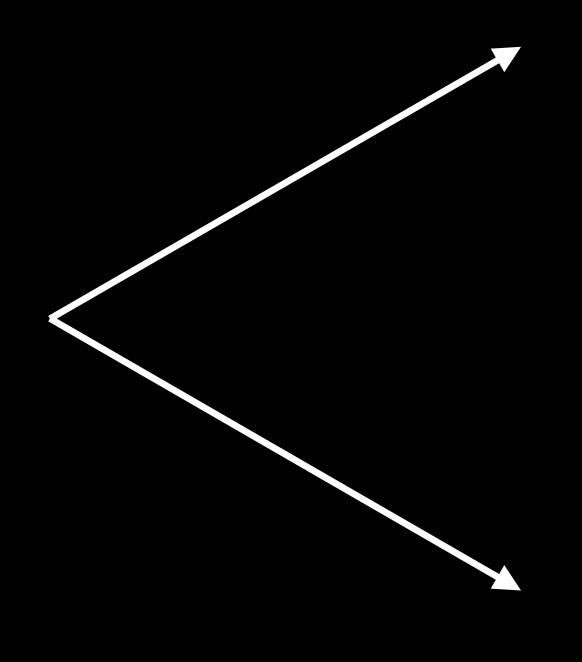# Predictive maintenance

**"The alternative [to thinking ahead] would be to think backwards . . . and that's just remembering."
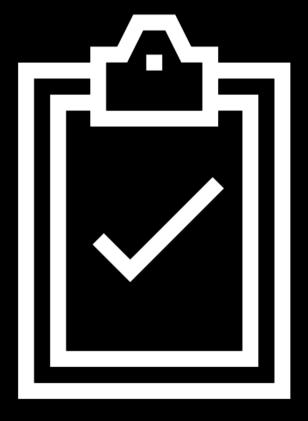—Sheldon, the theoretical physicist on The Big Bang Theory**

PREDICTIVE MAINTENANCE
Why?

SERVICE
Too late
- machine broke

SERVICE
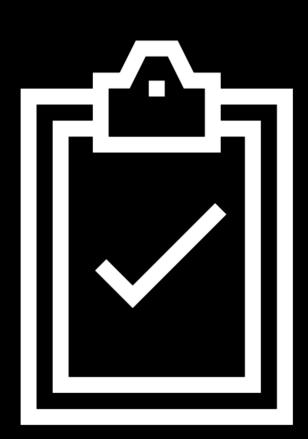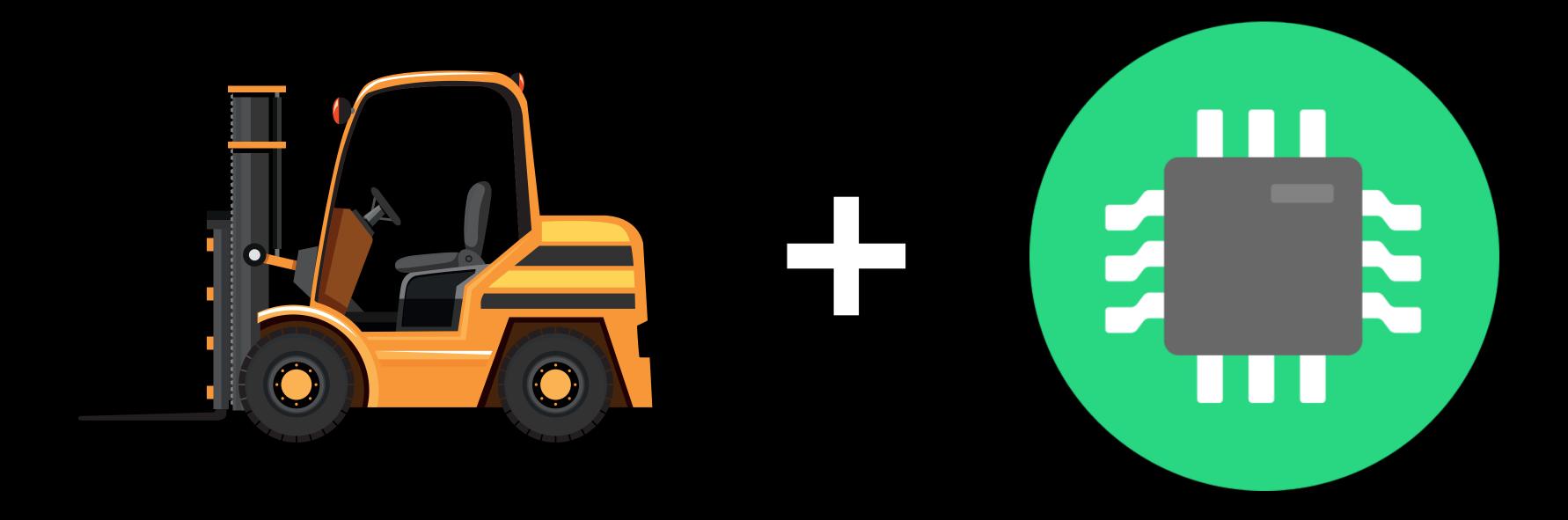Too early
- machine was fine

PREDICTIVE MAINTENANCE
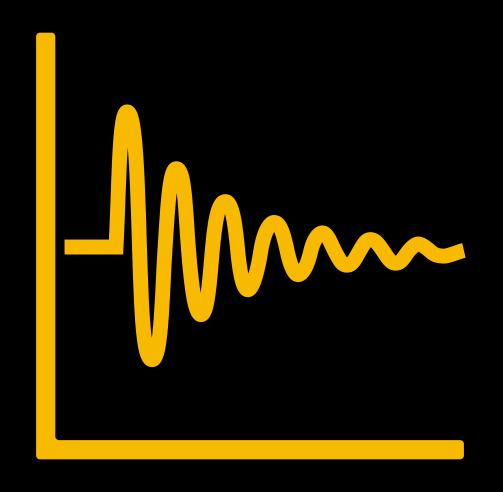Why?
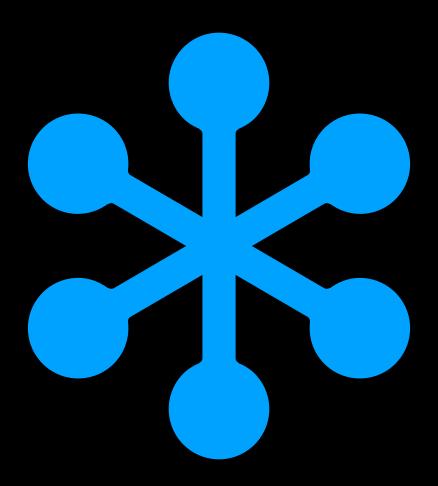
EITHER WAY
Costly
- unnecessary
expenses

Idea

Measurements
- have several sensors measure vibrations on the key components of the forklift
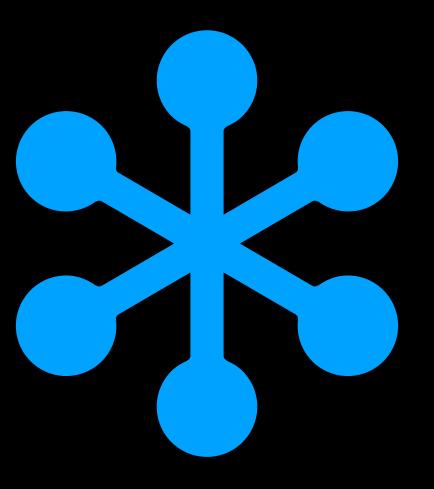- model which analyzes the data and tells us when the forklift needs to go into service

PREDICTIVE MAINTENANCE
Procedure

STEP #1
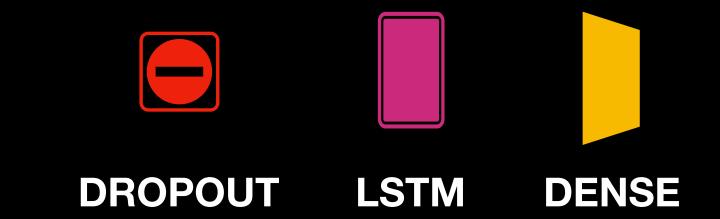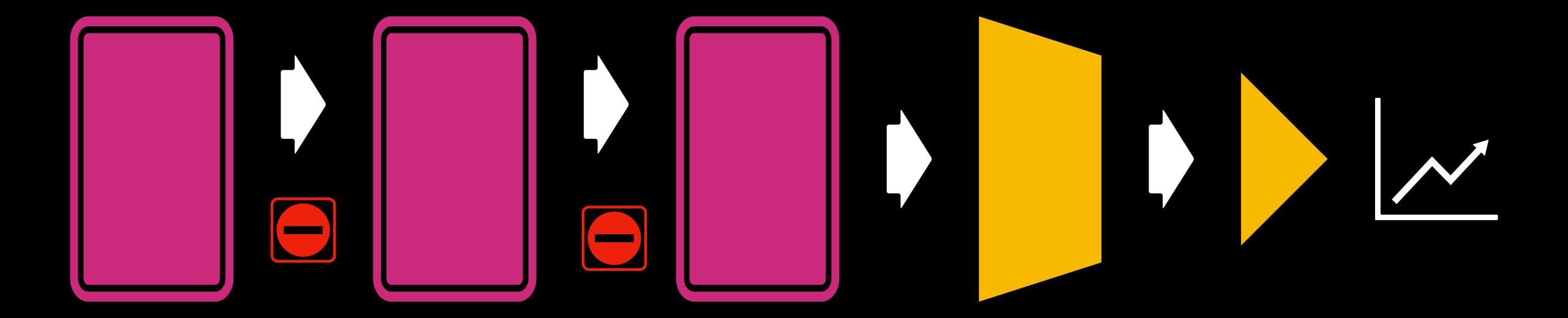## Data analysis

STEP #2
Modeling

STEP #3
Evaluation

OUR MODEL

Recurrent neural network (RNN)
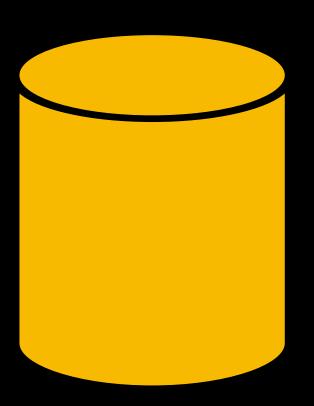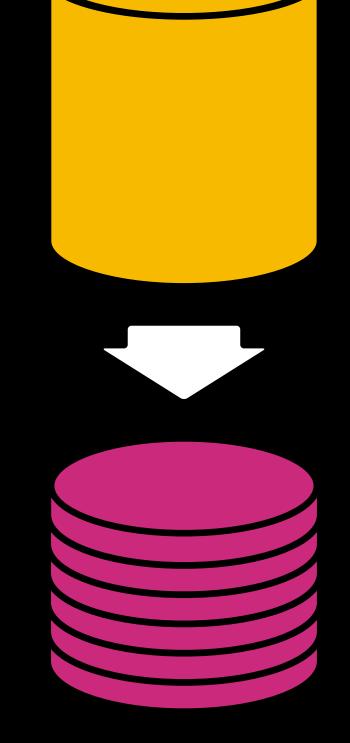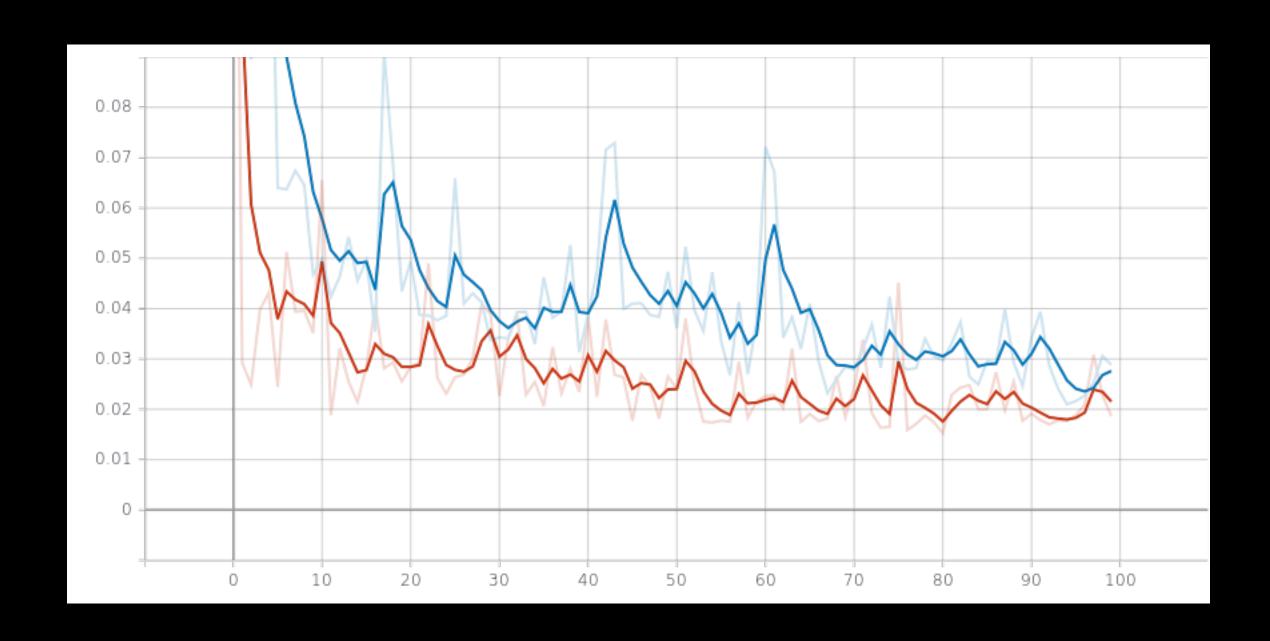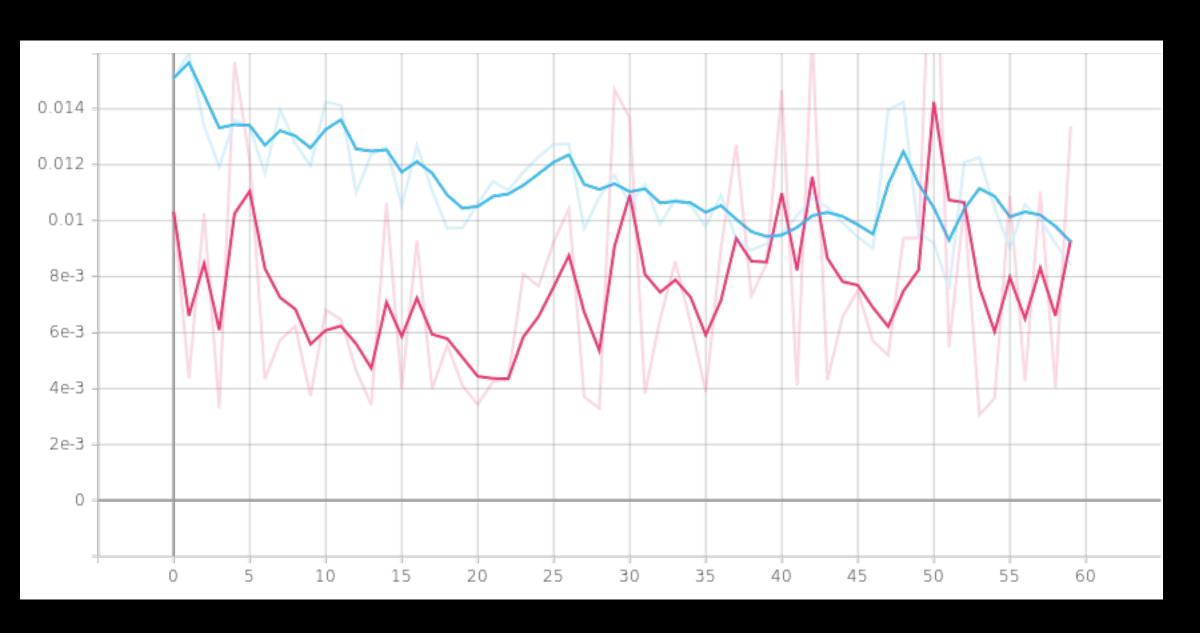
PREDICTIVE MAINTENANCE
Training paths

PATH #1
Per machine training

PATH #2
Transfer learning

PREDICTIVE MAINTENANCE
Performance
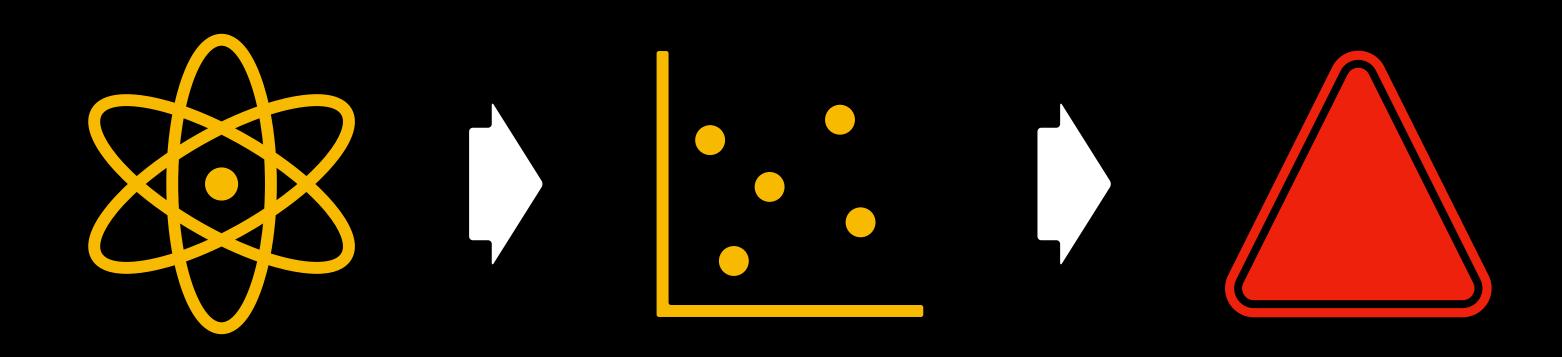
PATH #1
Per machine training
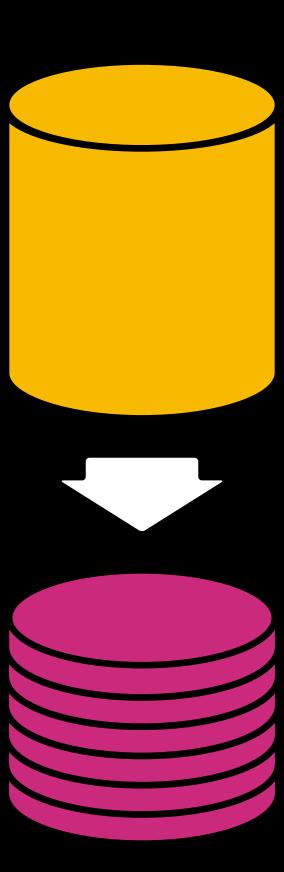
PATH #2
Transfer learning

Deployment

DEPLOYMENT

The prediction error is above threshold:
- **something is not behaving correctly**

"The alternative [to thinking ahead] would be to think backwards . . . and that's just remembering."

—Sheldon, the theoretical physicist on The Big Bang Theory