



**VALOHAI**

GitHub of Machine Learning

# Machine Learning 101 - Thinking with ML



# Content

- What is AI? How about machine learning?
- Are we all going to die?
- If we are not going to die what is going to happen?



# Machine Learning

When manually programming the solution is hard or impossible

# TERMINOLOGY

## MACHINE LEARNING

- All models
- Decision tree
- Linear regression
- Neural networks
- Deep learning

## DEEP LEARNING

- Deep neural networks
- CNN
- RNN
- LSTM
- Deep reinforcement learning

## ARTIFICIAL INTELLIGENCE

- General AI
- An umbrella word with no real definition

# SUPERVISED VS UNSUPERVISED

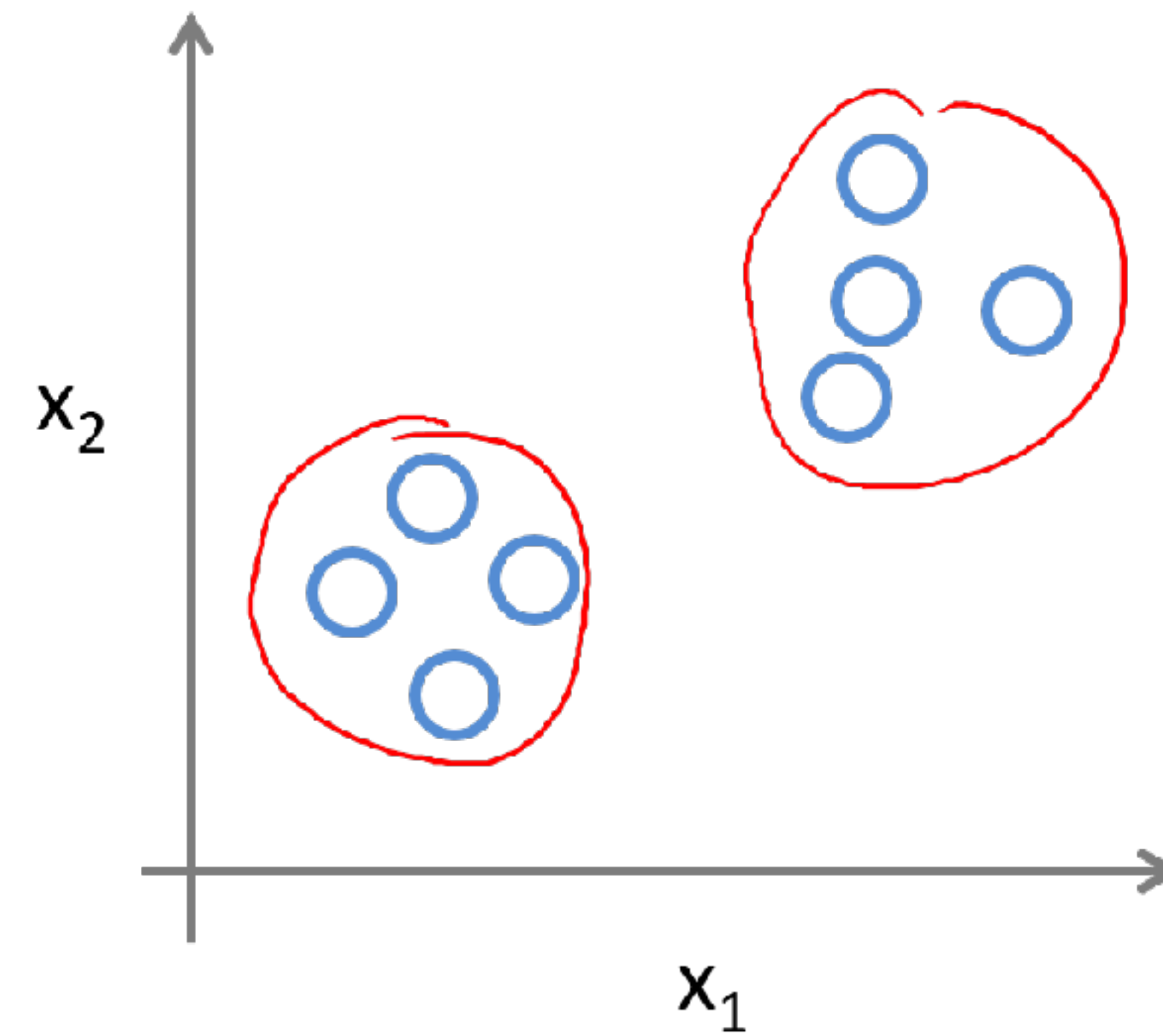
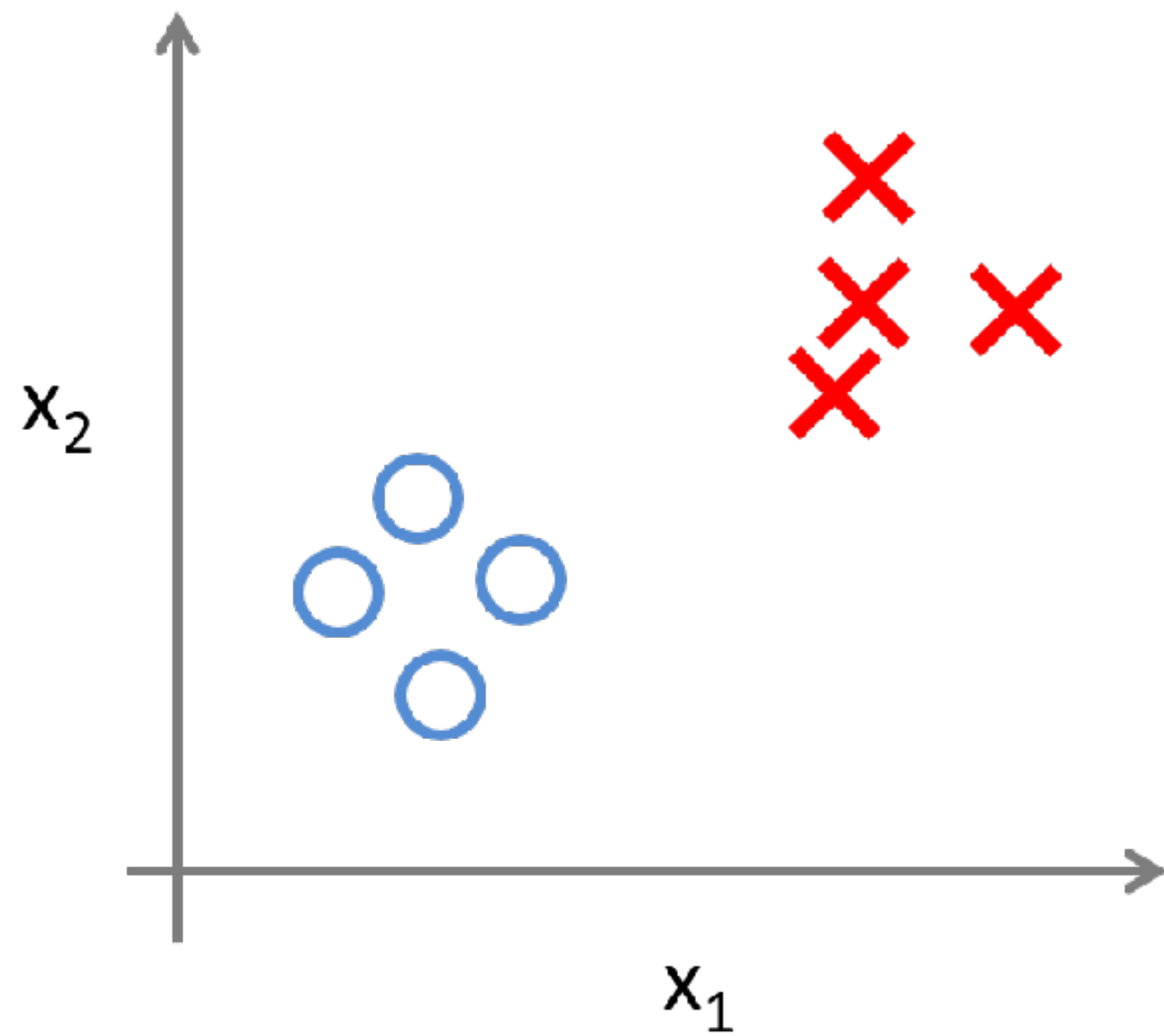
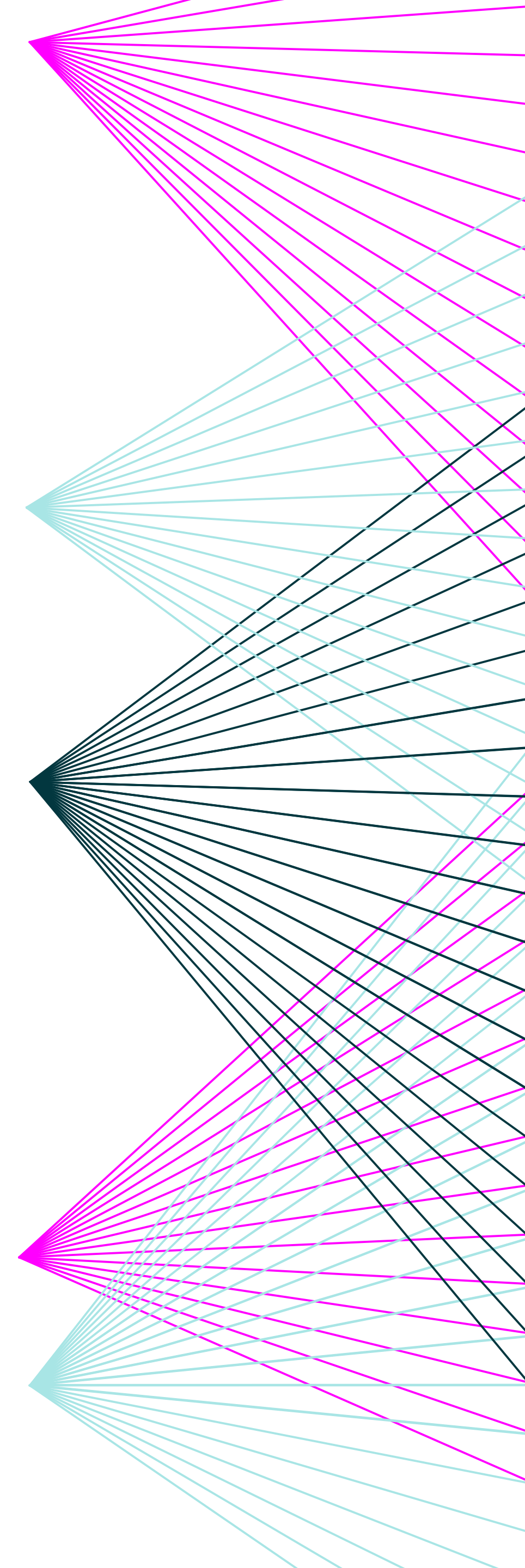
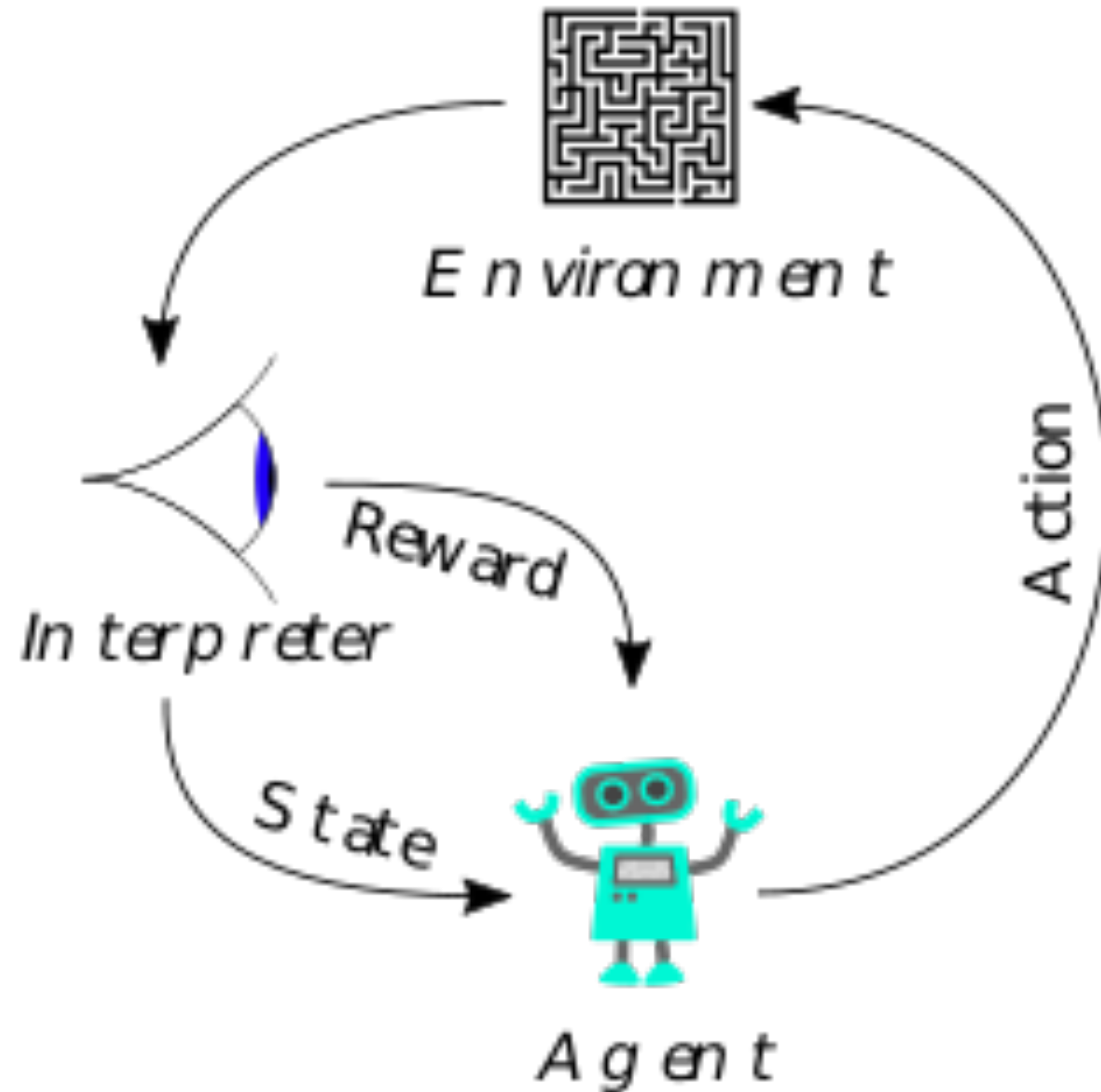


Photo credit: <http://oliviaklose.com/>



# Reinforcement learning

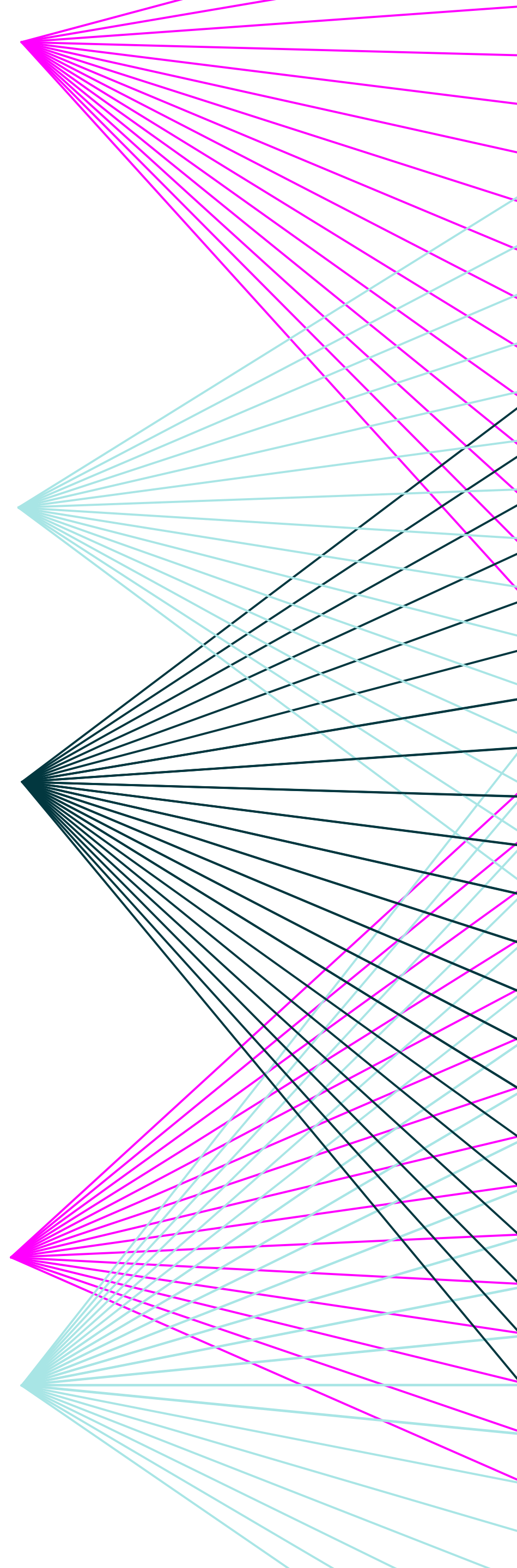


# Reinforcement learning

AI

Advances in Artificial Intelligence  
Machine Learning

John G. DeRose and Jonathan P. How



# WORKFLOW

- Define the problem
- Gather the data
- Fix the data
- Pick a model
- Train the model and iterate on it
- Check the results
- Deploy the model



# USE CASES TODAY?

- Risk analysis
- Predictive maintenance
- Machine written articles
- Self driving cars
- Natural language processing
- Credit card fraud
- Image recognition

# ARE WE GOING TO DIE?

- No.
- Applications of known technology are very limited

# IF WE ARE NOT GOING TO DIE?

- **Robots as legal objects?**
  - Taxation
  - Legal responsibility
- **New scalable business models**
  - Self driving
  - Human interaction
  - Teaching, care taking, motivation

# IF WE ARE NOT GOING TO DIE?

- **Technological unemployment**
  - 47% jobs atomated by 2025 in US (Frey & Osborne 2013)
  - 35 % in Finland (Pajarinen and Rouvinen 2014)
  - 59 % in Germany (Brzeski and Burk 2015)
  - 9% in US (Arntz 2016)
  - Maybe a good thing?
- **Everyone has the models, only big guys have data**
  - How do we democratise this?



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**Thank you!**