Improving user value through Machine Learning

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Background

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- Tech entrepreneur

- Philantropist

- Astronaut

Today: three concepts

- Two-sided platforms

- User value

- Machine learning

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- What is a platform?

- Social recruitment platform

- Astronaut mediates the transaction of information between companies and connectors

  - A two sided market
  - Facilitates the interaction
  - The value of one group depends on the other
  - Unique value propositions for each user group

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Platform types

	P2P	B2C	B2B
Product	Etsy	Spotify and Netflix	Alibaba
Property	Airbnb	Hotels.com	Spacebase
Human resources	Uber	Washio	Graphiq.Design

So what?

- Five most valuable companies in 2016 were software platforms

- Technology is important in two-sided platforms

- But technology by itself does not create value

- How can machine learning be used to improve the platform?

- Need to understand the underlying mechanism of creating value for the user

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Four steps to epiphany

Step 1: User problem and user value

Step 2: The machine learning problem

Step 3: Feedback loop

Step 4: Performance standards

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Use case: Airbnb

- Galaxy Championship in pod racing being hosted in Trondheim

- Arthur Dent signs up as host

- He has a spare room, and want to make cash and meet space people, but..

  - Once in a generation event
  - Every hotel sold out
  - Already traveled from other planets, high price point
  - Unique apartment

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Step 1: User problem and user value

~~Aggregation~~	Trust	Streamlined processes
~~Co-creation~~	Personalization	Reduced search cost

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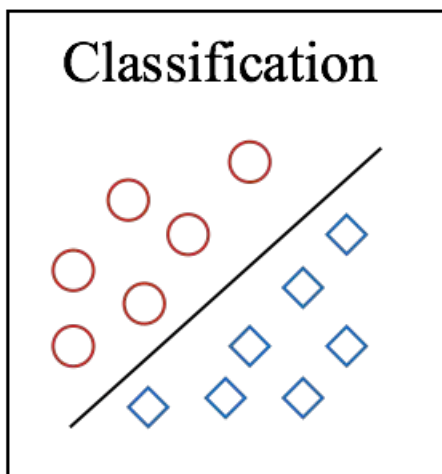# Step 1: User problem and user value

User problem

It is hard for the user to know what is the right price for their apartment (intergalactic payments and all)
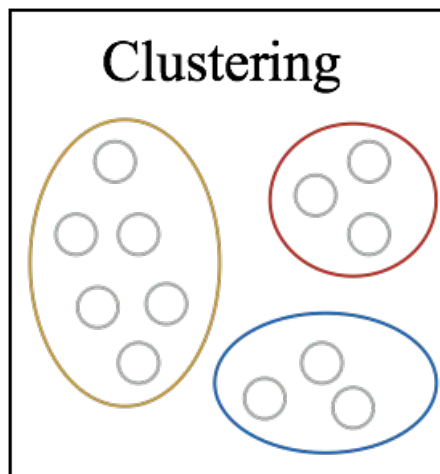
User value

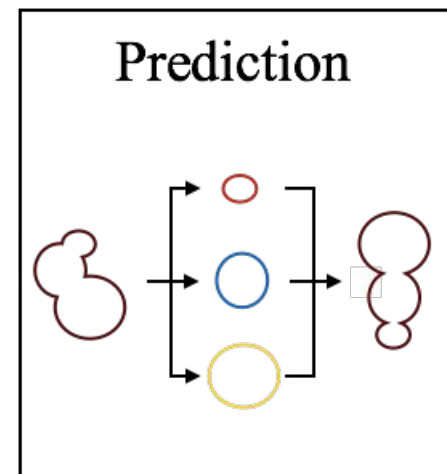The user wants personal suggestions on how to price his/hers unique apartment

Personalization!

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Step 2: The machine learning problem

Classification

- Categorizing concepts
- Training data
- Classification scheme

Clustering

- Grouping similar things
- Discover similarities
- Unknown solutions

Prediction

- Generalization/recommendation
- Deduce general description

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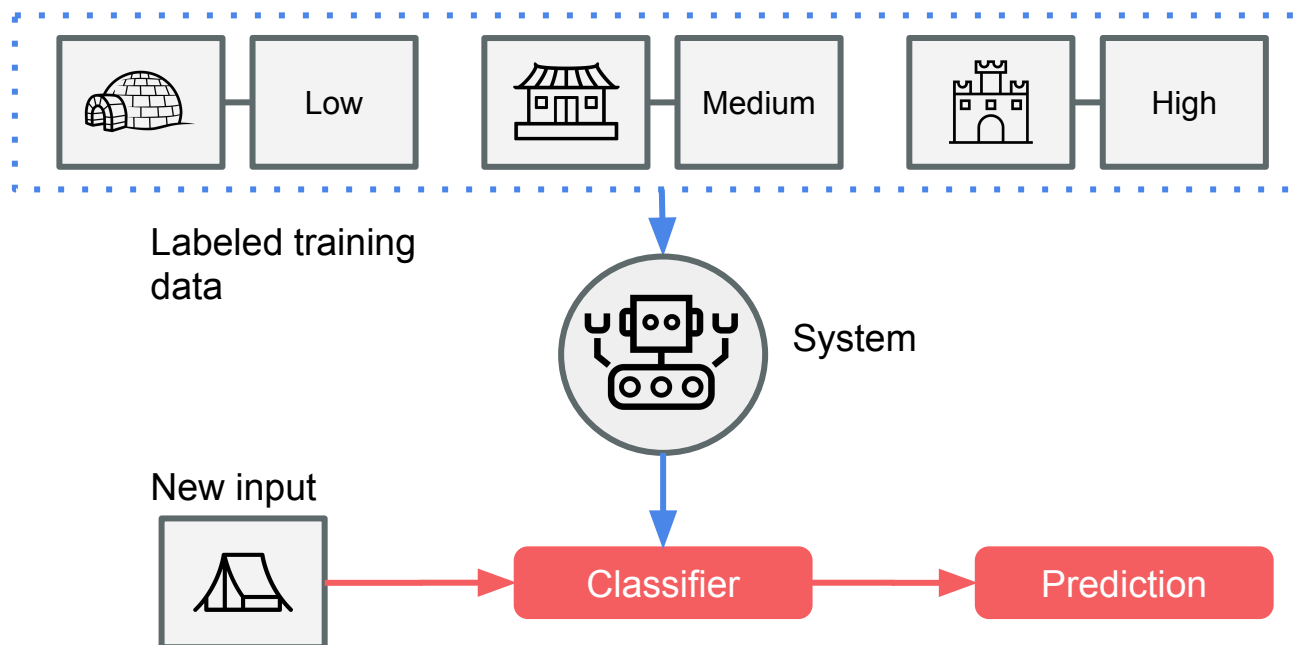# Step 2: The machine learning problem

Task

Classify whether an apartment will get booked or not for a certain price

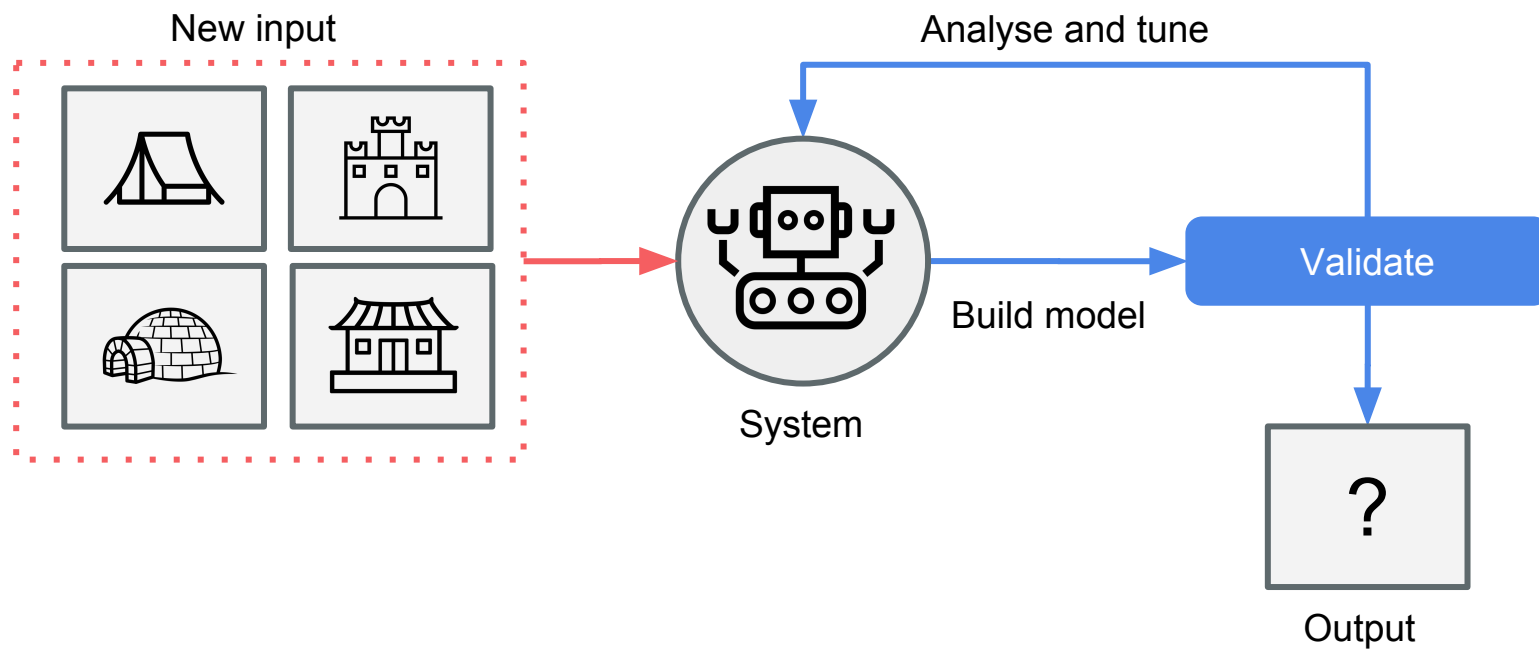Classification problem

Step 3: The feedback loop
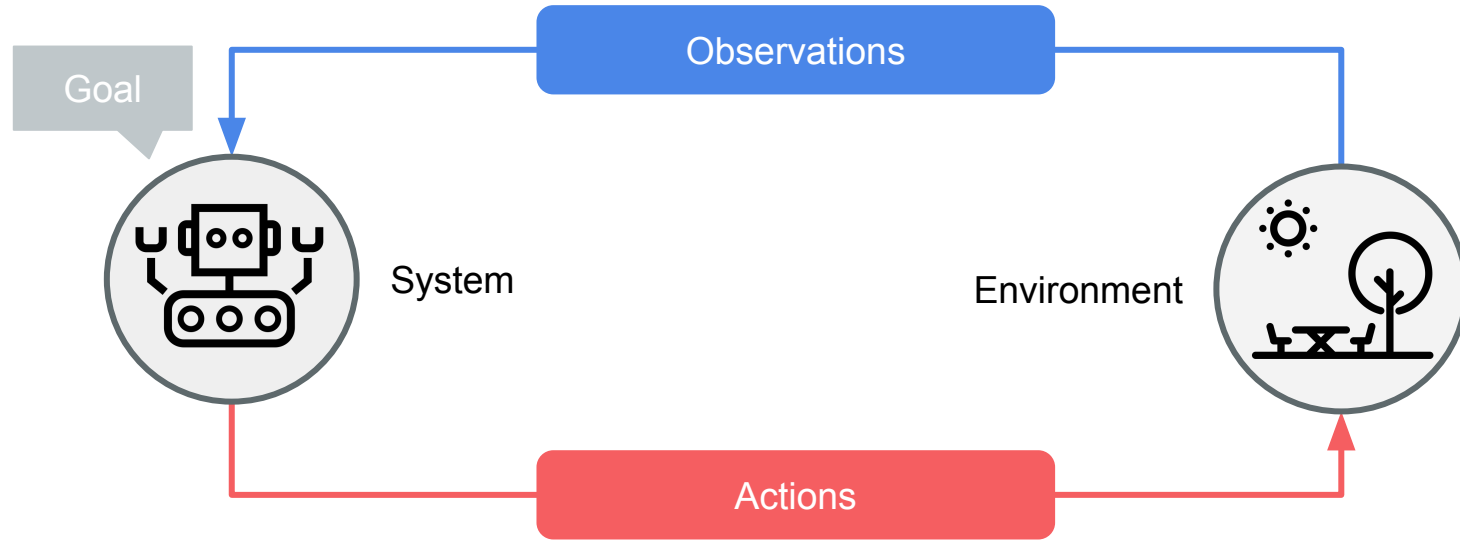
1) Got labeled training data? -> Supervised learning

Labeled training data

New input

System

Classifier → Prediction

Low   Medium   High

Step 3: The feedback loop

2) No knowledge about output? -> Unsupervised learning

New input

Analyse and tune

System

Build model

Validate

?

Output

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Step 3: The feedback loop

3) Rule based environment? -> Reinforcement learning
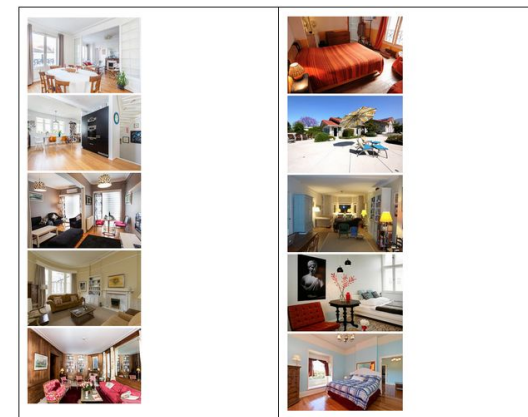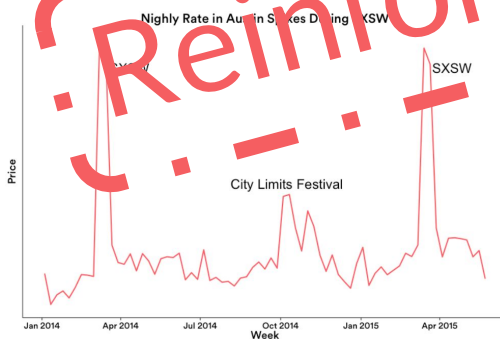
Goal

Observations
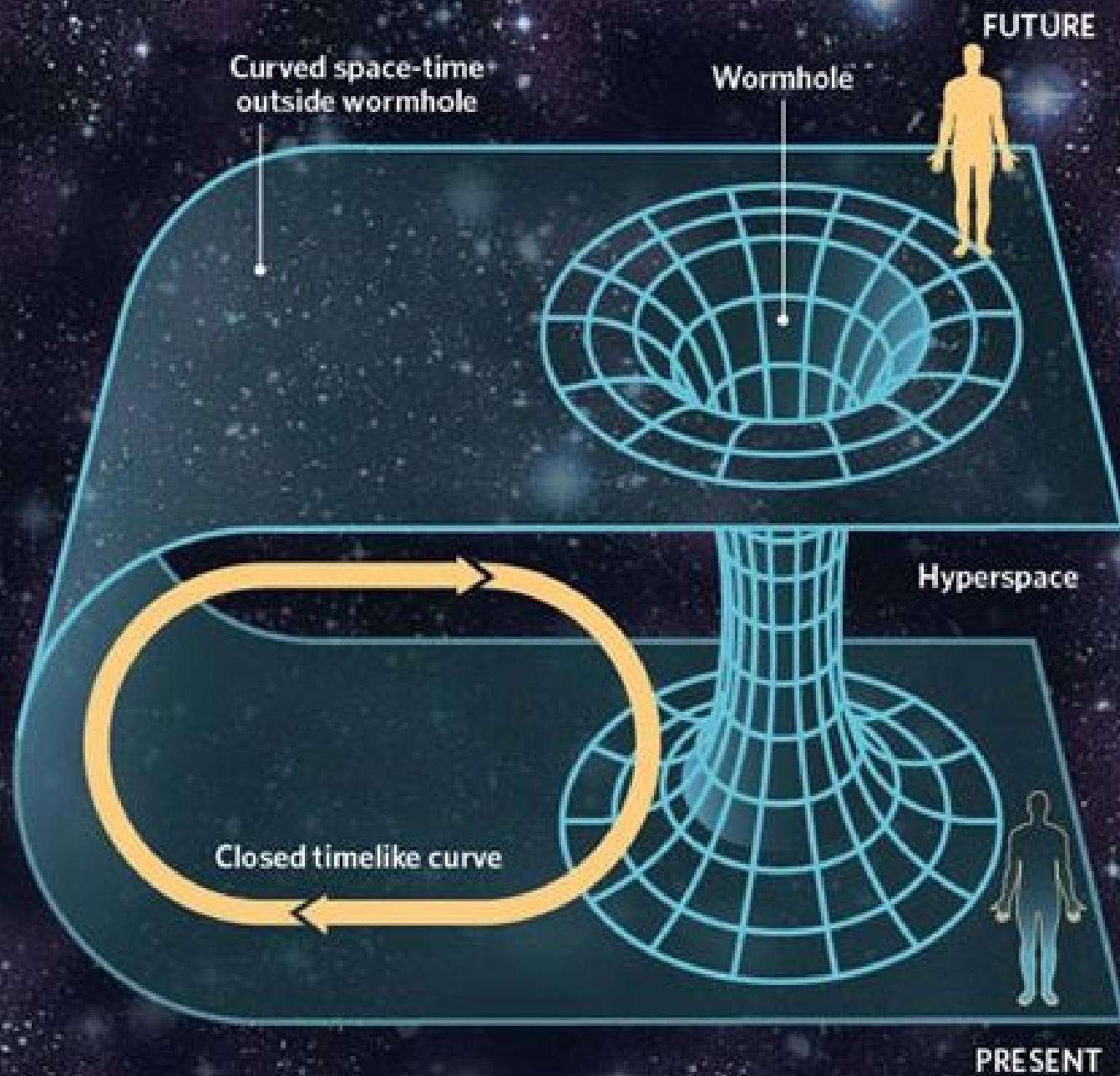
System

Environment

Actions

Step 3: The feedback loop

Experience

Images of the apartment, historical data, seasonal variance, geographical location, local events, real time data from users
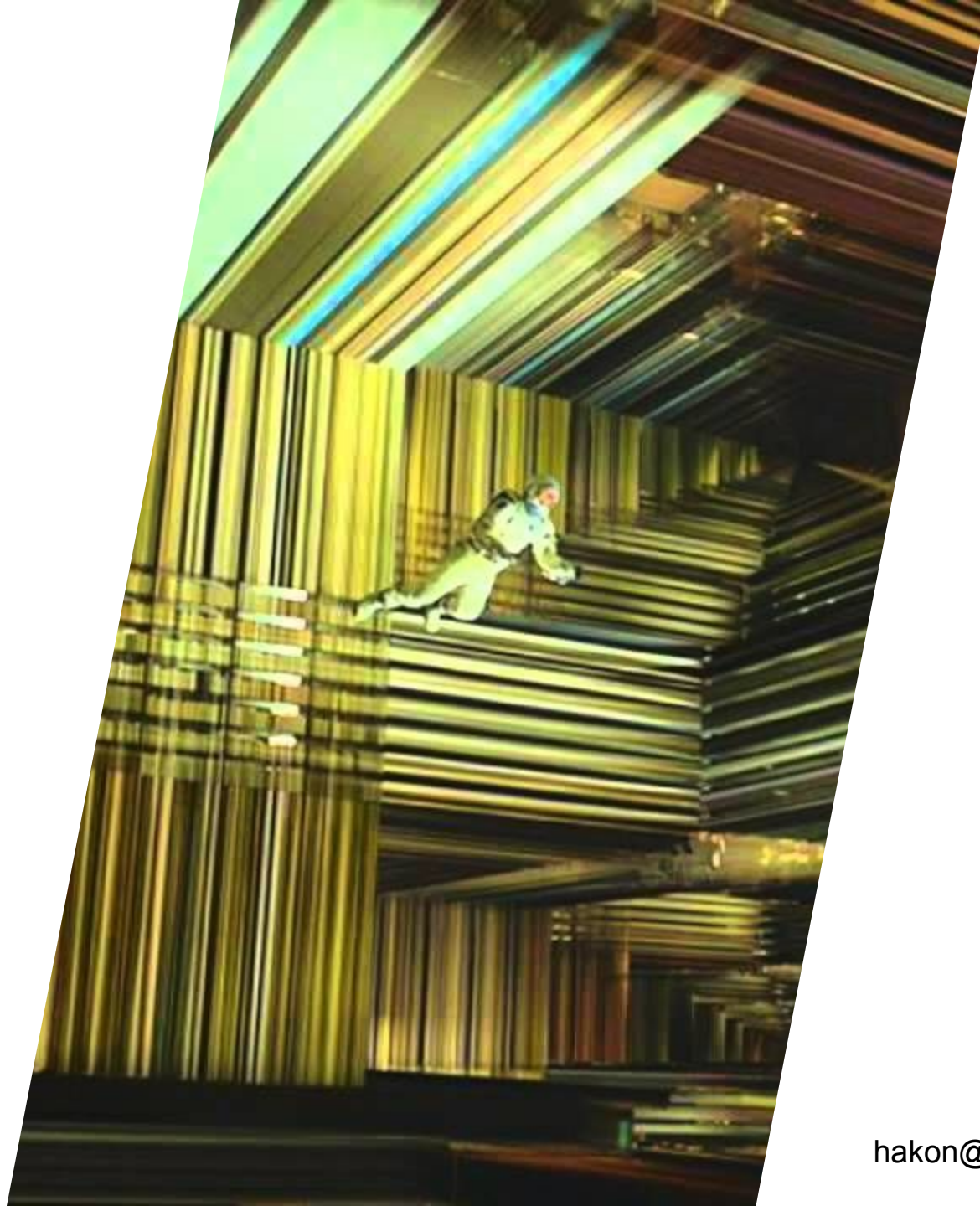
Reinforcement learning

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Step 4: Travel through time-space continuum

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Curved space-time outside wormhole

Wormhole

FUTURE

Hyperspace

Closed timelike curve

PRESENT

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It's not a ghost...

Step 4: Performance standards

Performance

Prediction accuracy, the number of bookings predicted correctly out of all bookings.

Airbnb - Dynamic pricing

User problem: Apartment pricing

User value: Personalization

Task: Classification
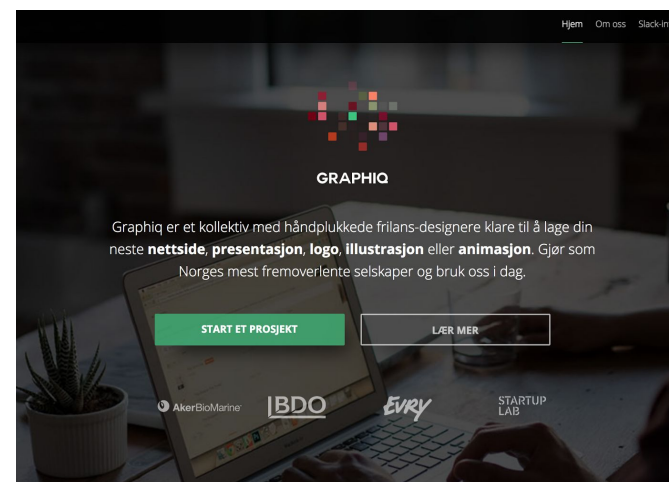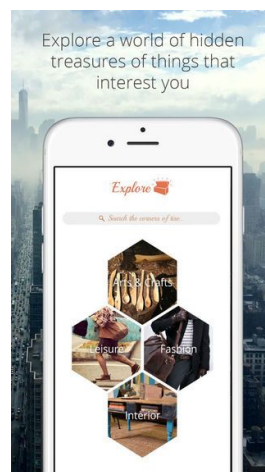
Experience: Reinforcement learning

Performance: Prediction accuracy

Airbnb - Dynamic pricing

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Airbnb - Other use cases

	Classification	Clustering	Prediction
Personalization			Dynamic pricing
Trust	Fraud detection		Detecting host preferences
Reduced search cost	Local neighborhoods		
Streamlined processes	Customer request categorization		

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Case studies

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Q&A

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