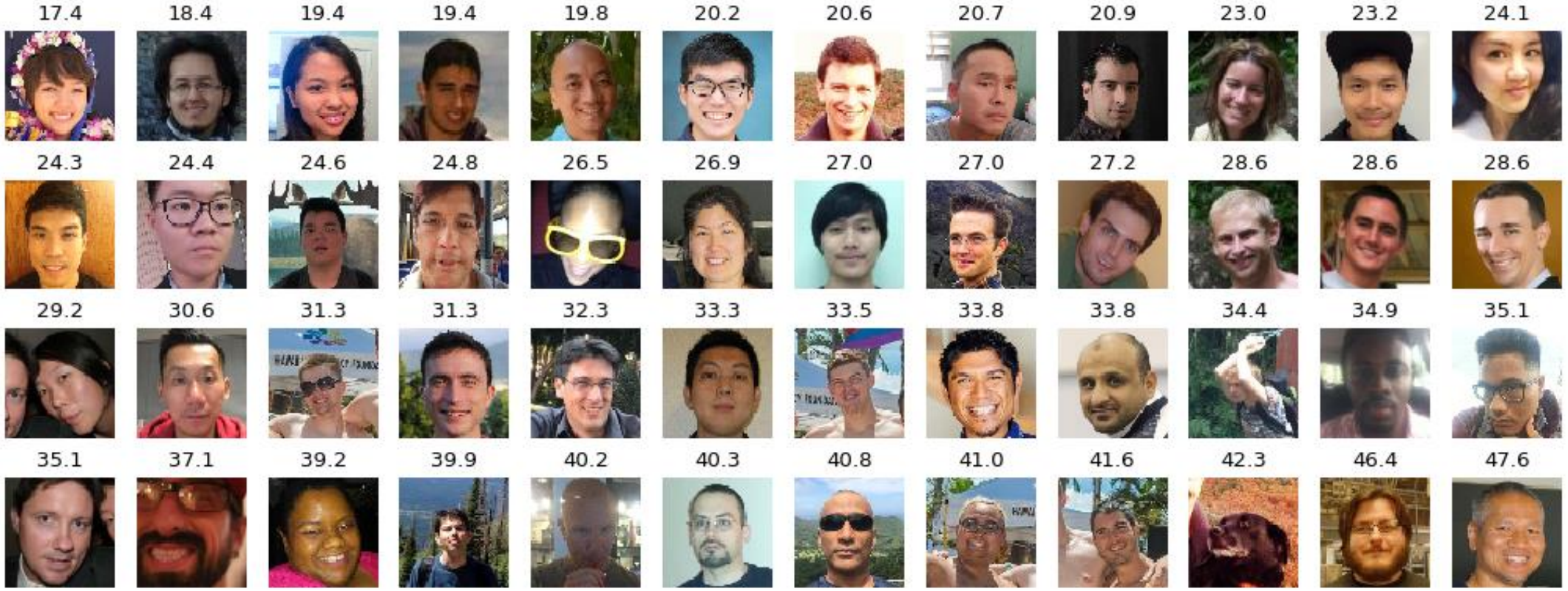
Hawaii Machine Learning Meetup



Matthew Motoki

Thomas Yokota

Sorapong Khongnawong

Michael Motoki

Introduction – Organizer's Backgrounds

- Mike
  - Education: Master's in Urban and Regional Planning
  - Work Experience: Transportation Planner
- Matt
  - Education: BS Math; MS Electrical Engineering - Reinforcement Learning
  - Work Experience: Analytics Consultant
- Tom
  - Education: MPH Public Health, Epidemiology Specialization
  - Work Experience: Data Scientist
- Sora
  - Education: BS in Electrical and Computer Engineering
  - Work Experience: Software Development in C and C#

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Introduction – What is Machine Learning?

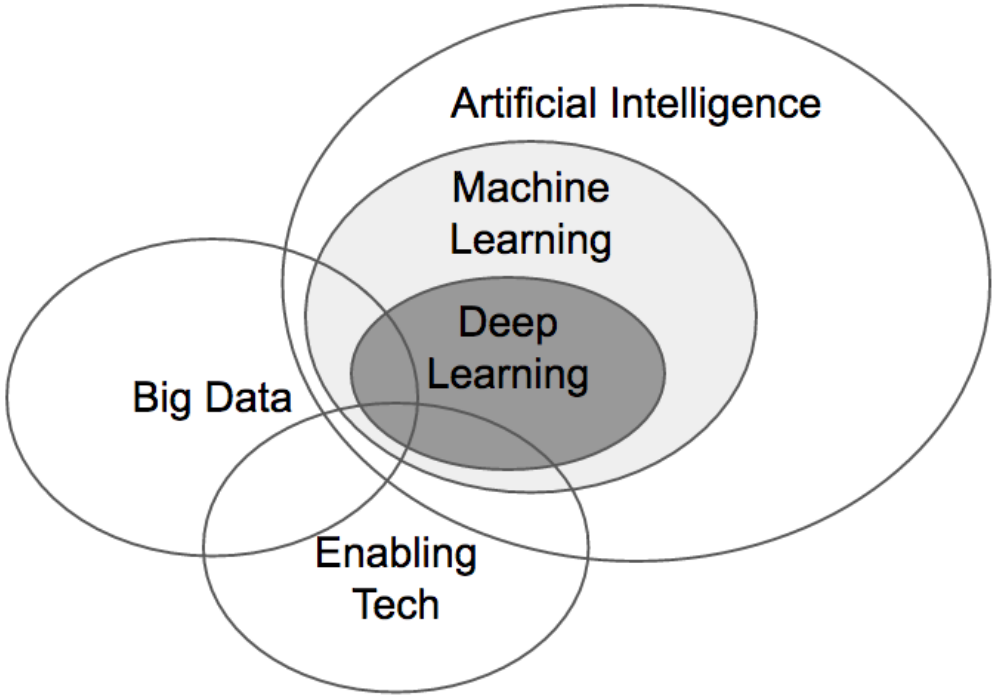
In your own words, what is machine learning?

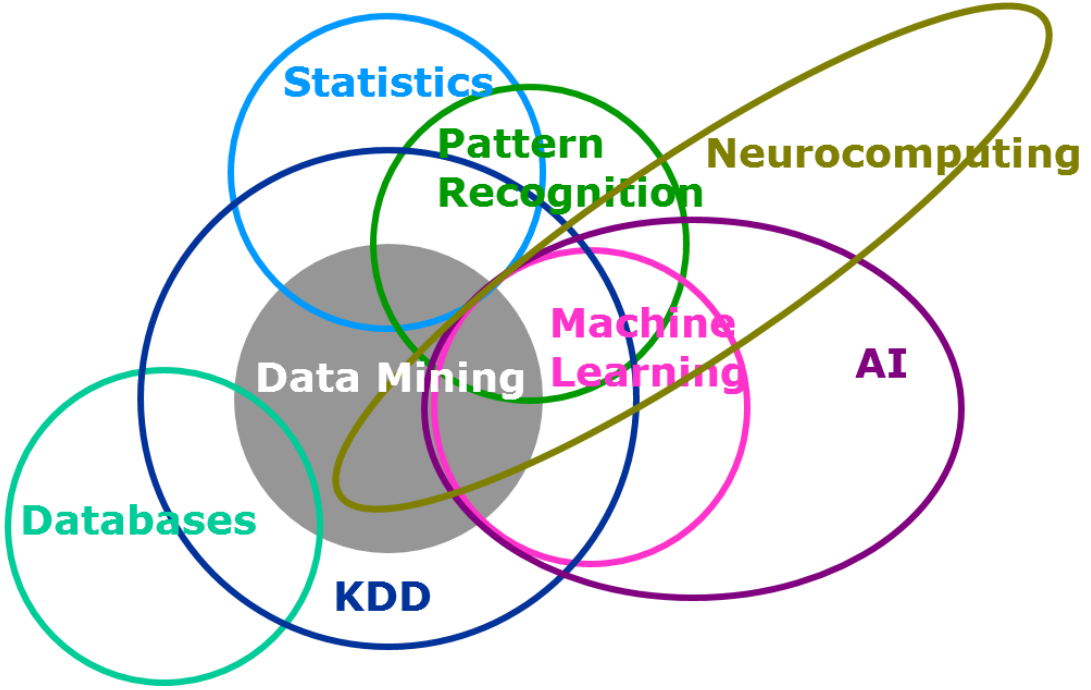
- The process of programmatically optimizing linear algebraic approaches in order to maximize the accuracy of a classification or regression model.
- Training statistical models to predict things with data.
- Computers doing cool stuff.
- Data science rebranded.
- Robots!

Machine learning is concerned with the question of how to construct computer programs that automatically improve with experience.

Introduction – What is Machine Learning?

What is machine learning?





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Introduction – Why Machine Learning?

Machine Learning Quotes

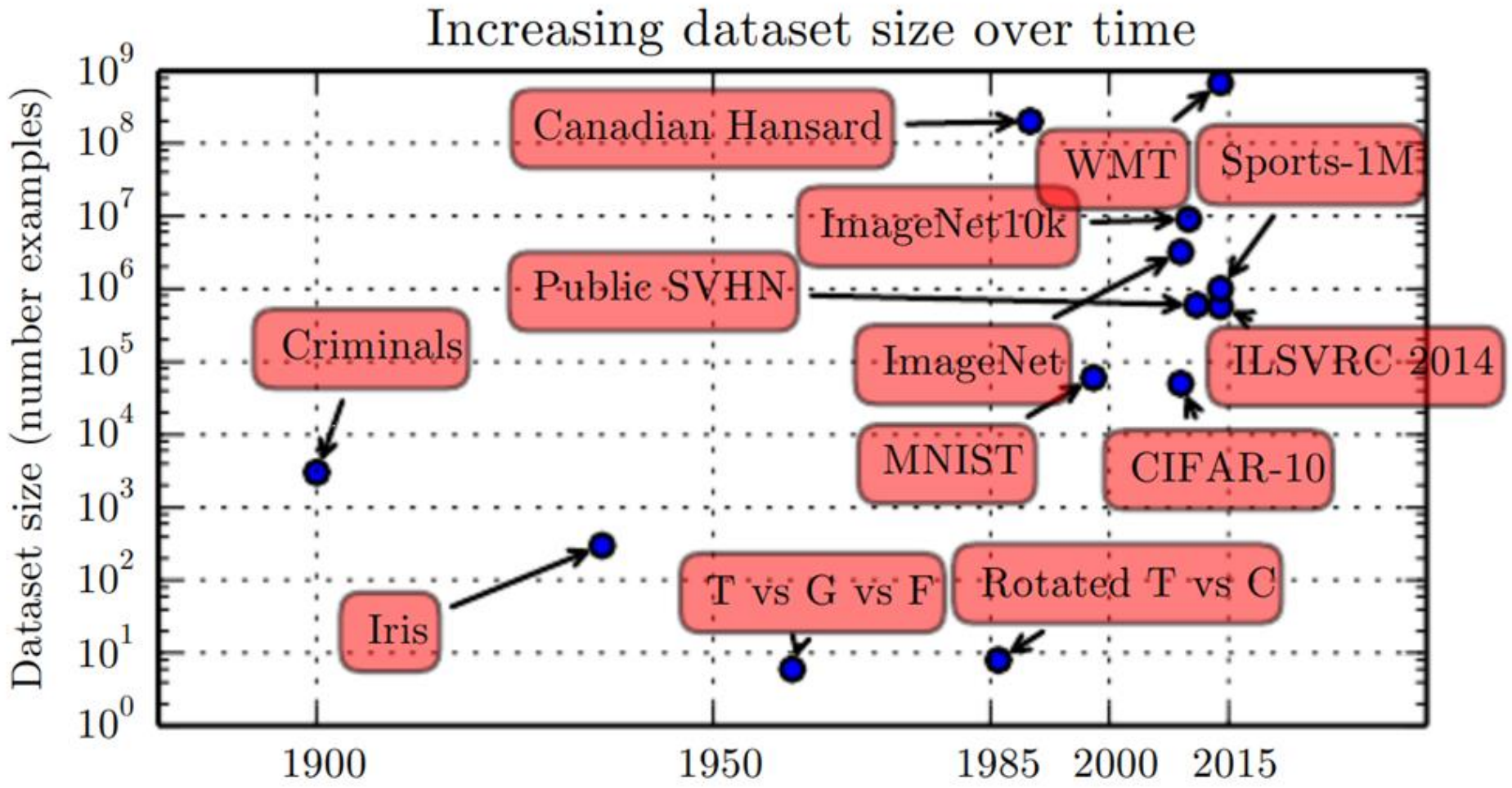
“A breakthrough in machine learning would be worth ten Microsofts.” — **Bill Gates**

“For a very long time it [deep learning] will be a complementary tool that human scientists and experts can use to help them with the things that humans are not naturally good.” — **Demis Hassabis**

“People worry that computers will get too smart and take over the world, but the real problem is that they're too stupid and they've already taken over the world.” — **Pedro Domingos**

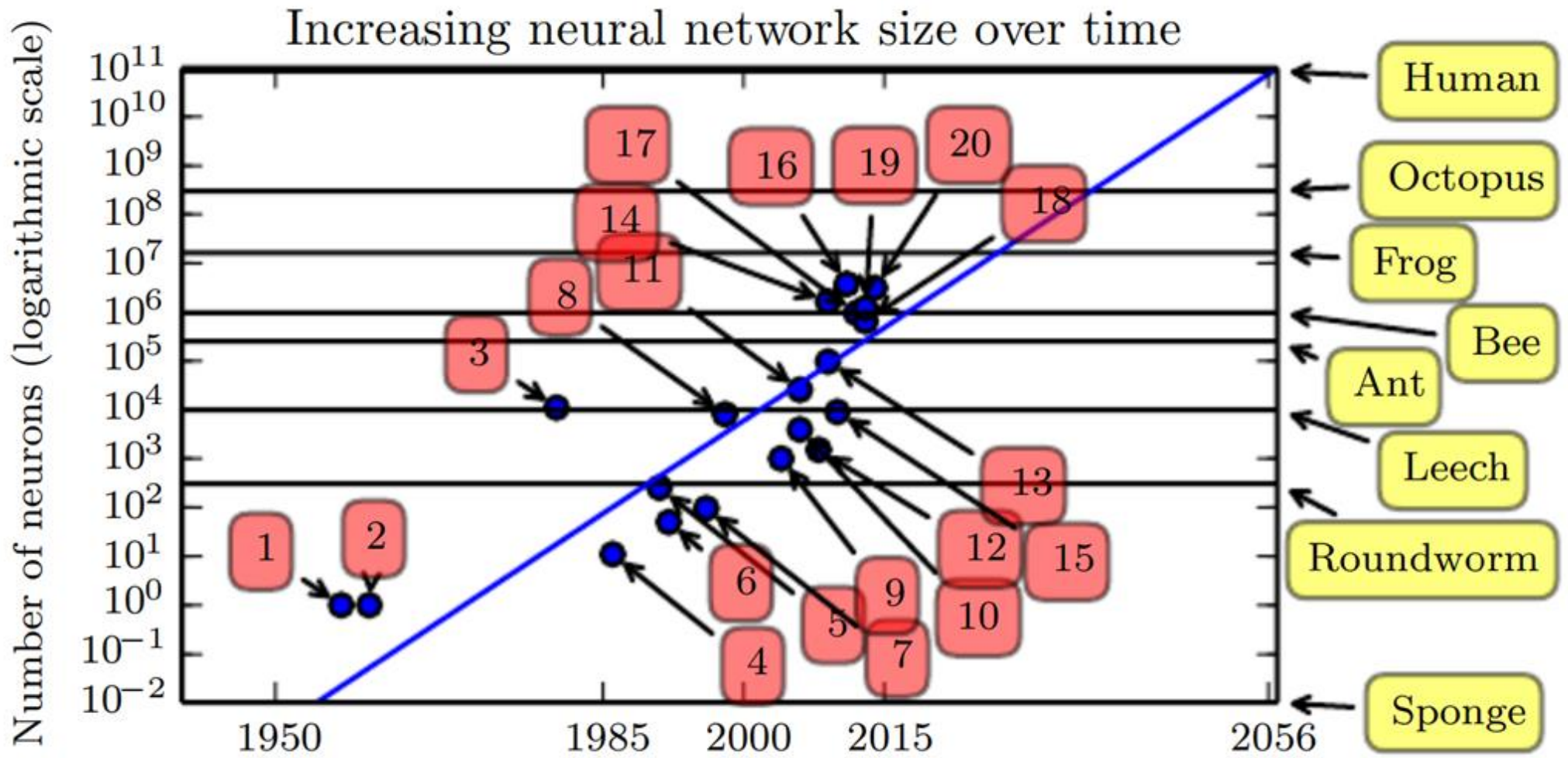
“Machine learning is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it...” — **Anonymous**

Introduction – Why Machine Learning?



Goodfellow et al., 2016

Introduction – Why Machine Learning?



Goodfellow et al., 2016

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Introduction – Why Machine Learning?

Applications of Machine Learning

- Weather forecasting

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- Fraud detection

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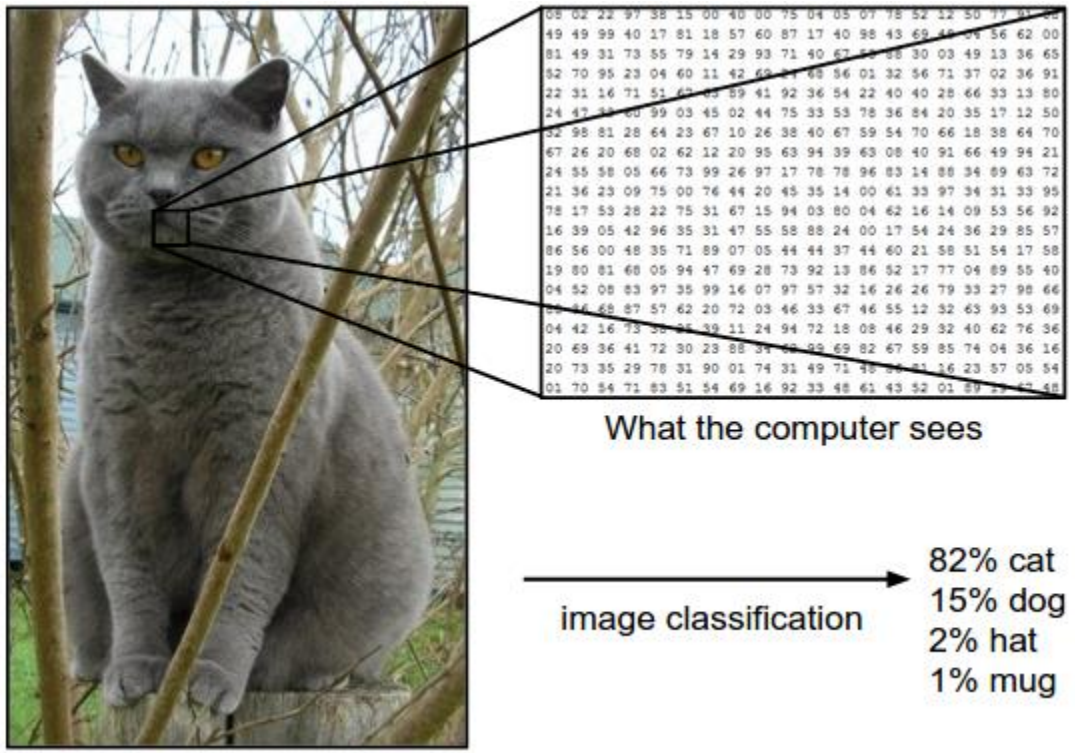
Applications of Machine Learning

- Weather forecasting
- Fraud detection
- Image classification



Introduction – Why Machine Learning?

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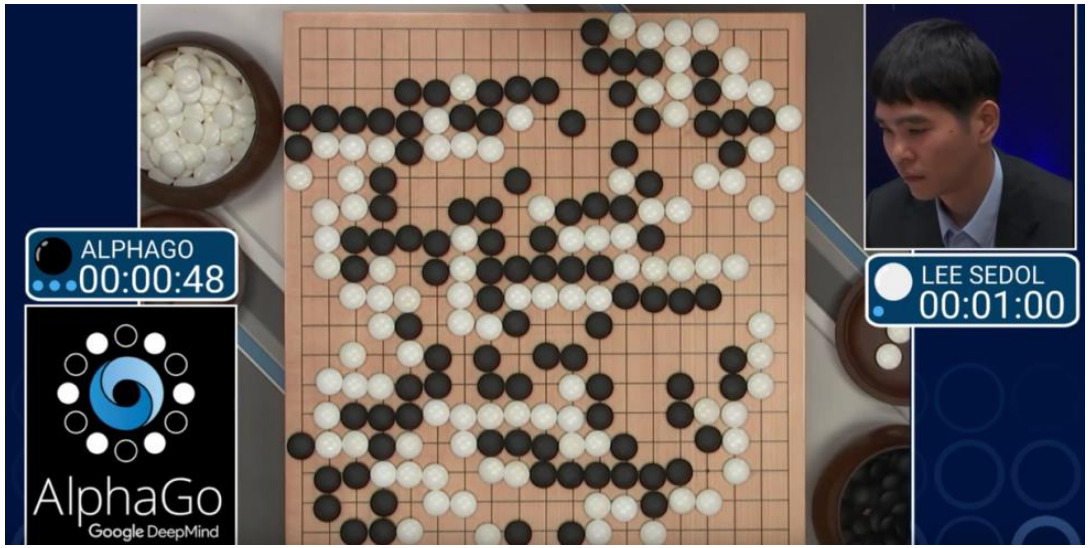
Applications of Machine Learning

- Weather forecasting
- Fraud detection
- Image classification
- Product recommendation
- Self-driving cars
- Game playing AI



Introduction – Why Machine Learning?

Case Study - Instacart

Goal: Predict the probability of product reorders

Data: Order history 300,000+ members 50,000+ products (1 GB)

Domain: Market Basket Analysis, One-step ahead forecasting

Solution:

- Gradient Boosted Decision Trees
- Deep Recurrent Neural Networks

Introduction – Why Machine Learning?

Case Study - Cell Division

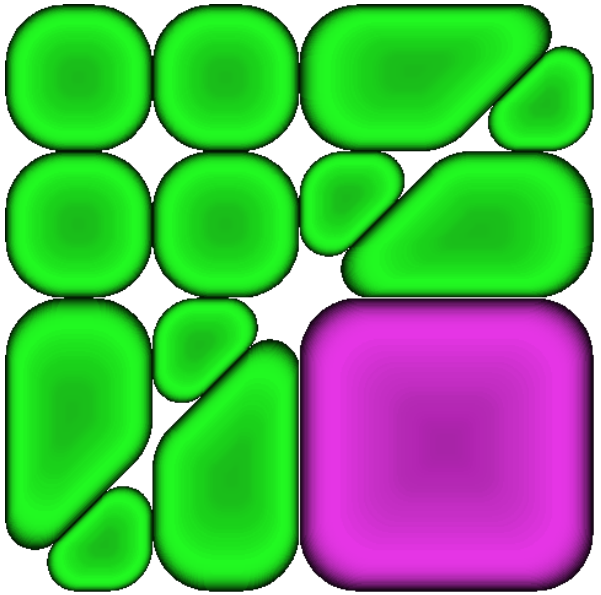
Goal: Create a board game with an AI opponent that learns

Data: Repeated self-play

Domain: Reinforcement Learning

Solution:

- Q-Learning with Epsilon Greedy Strategies
- Rollout Strategies with Base Heuristics



Cell | Division

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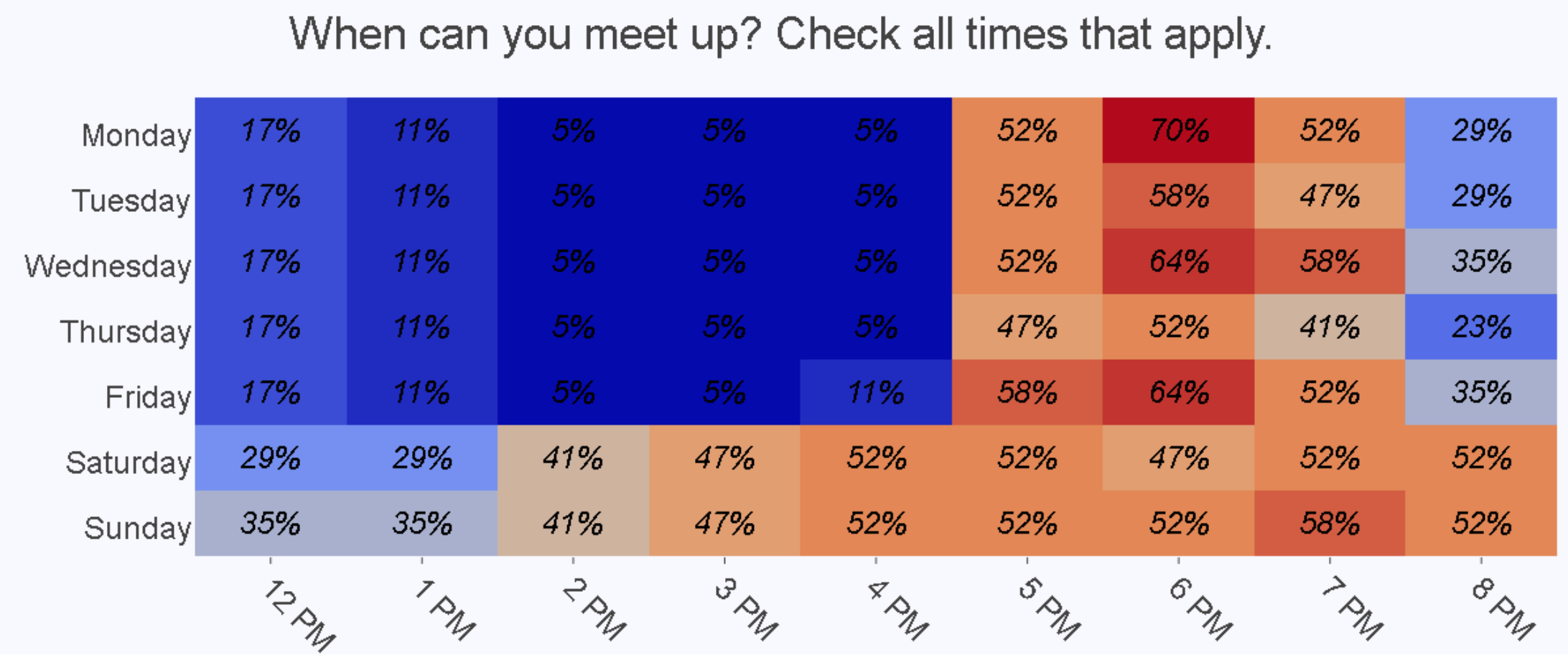
Member Survey Results



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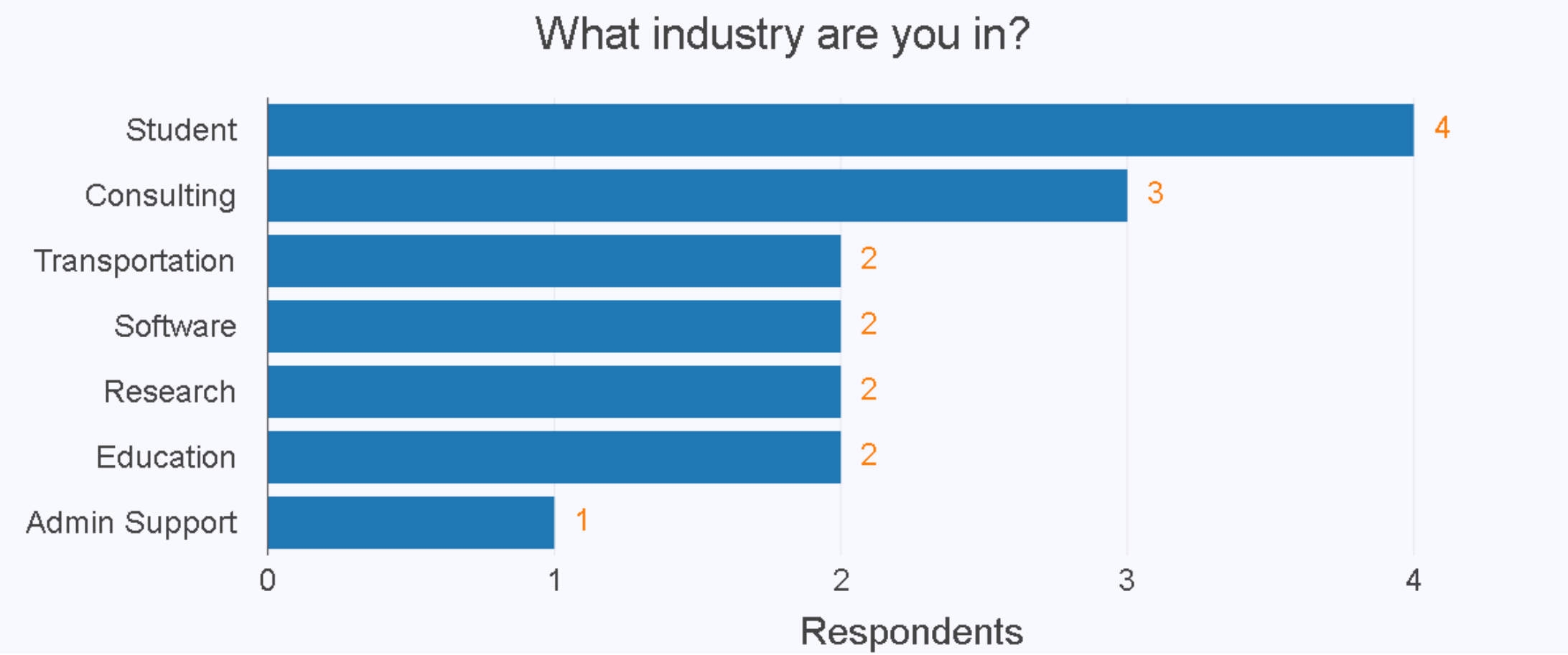

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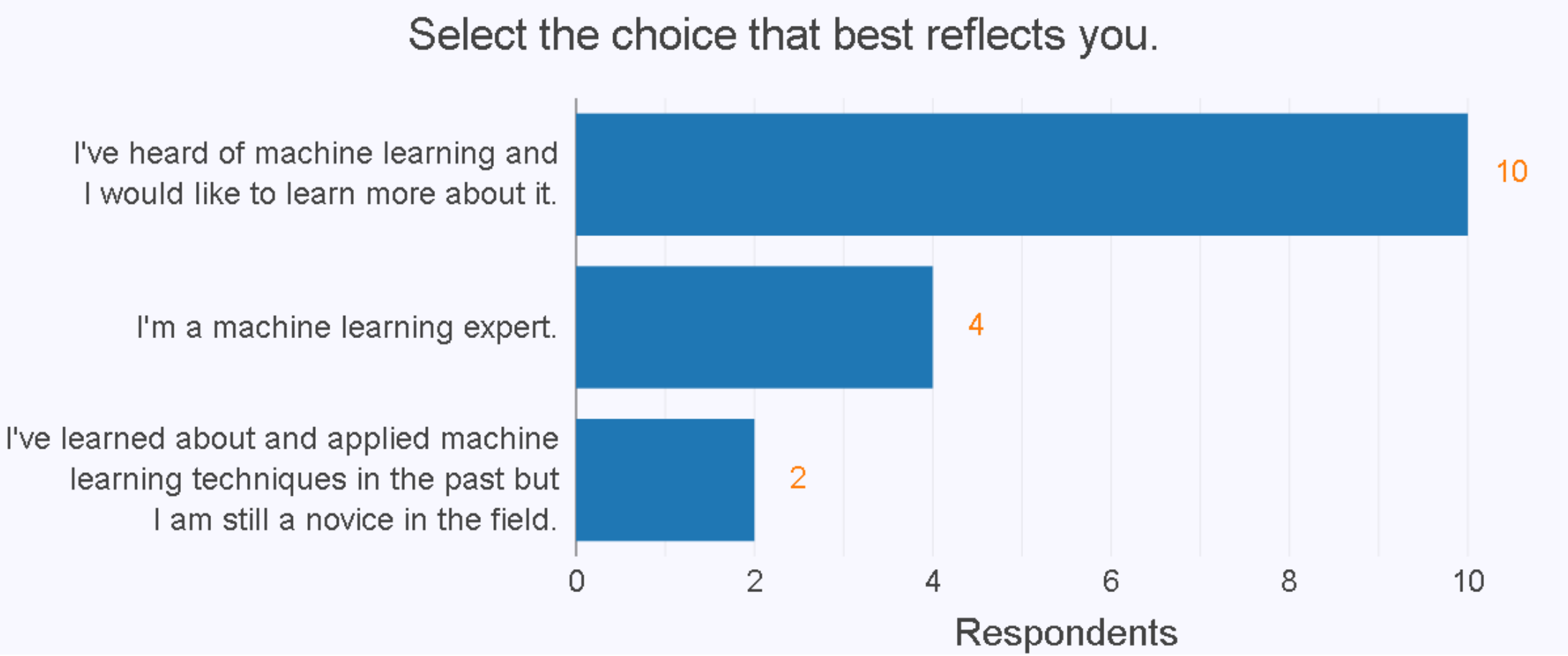

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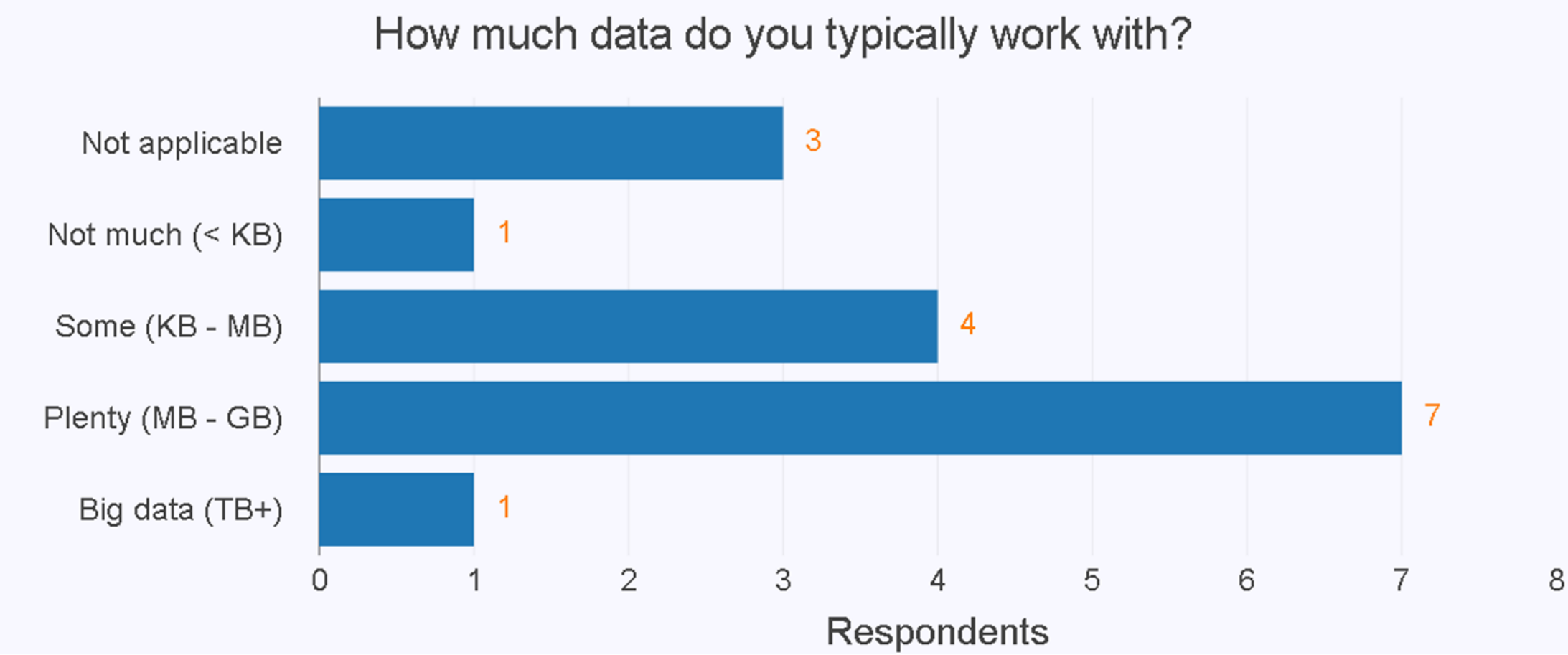

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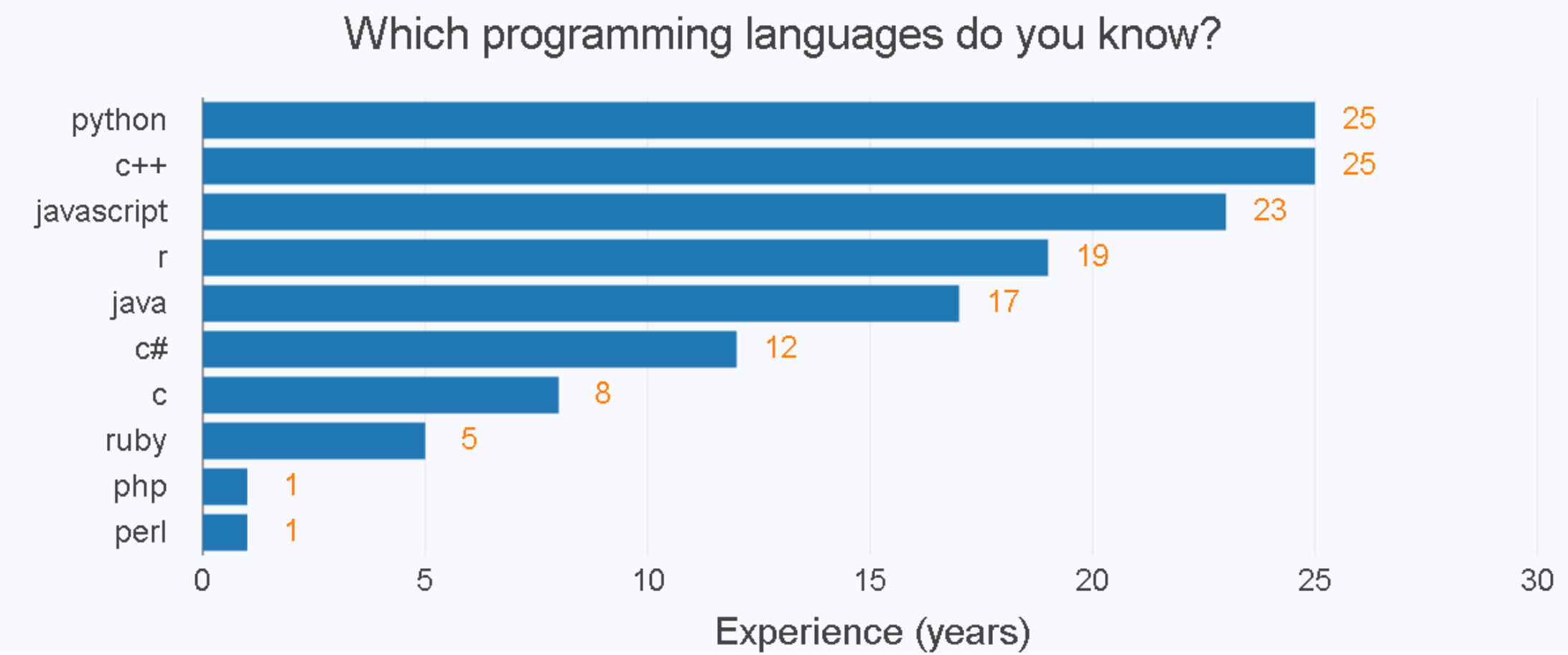

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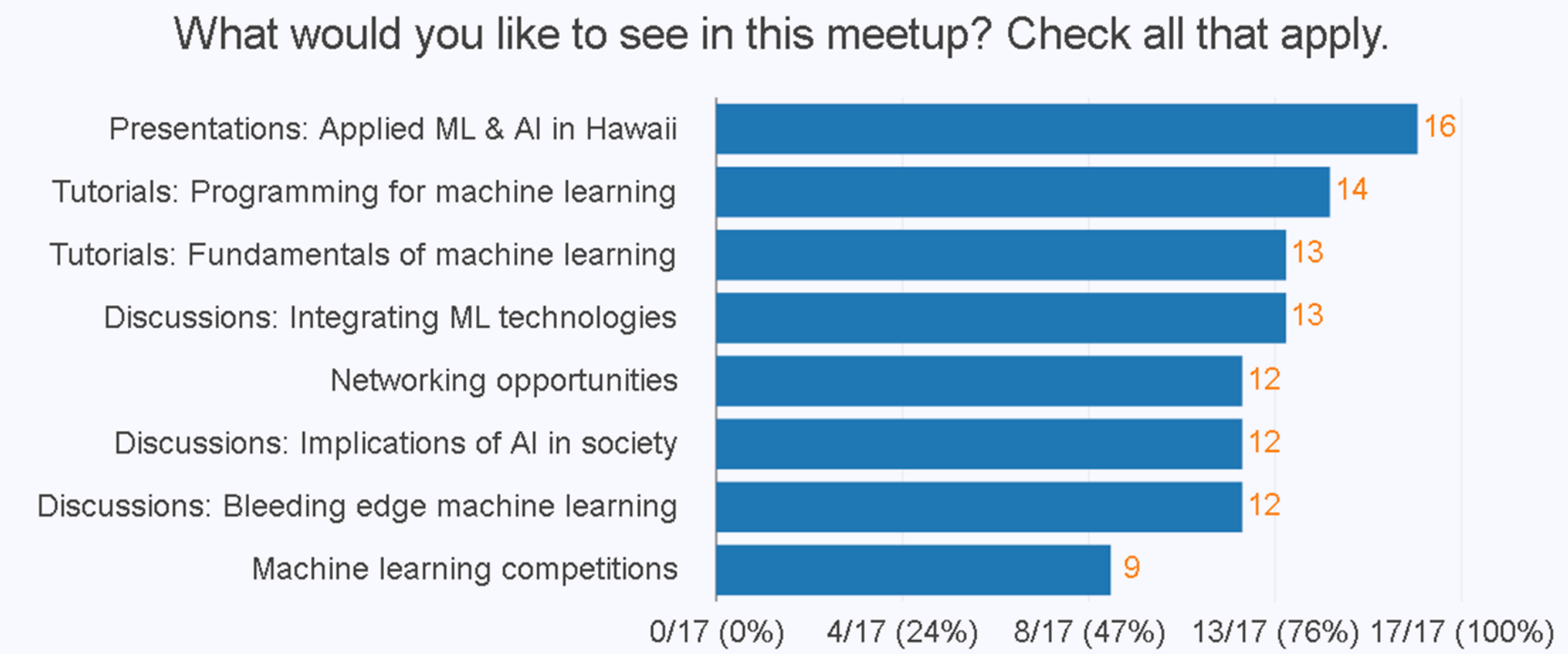

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What to Expect from this Meetup

Promote interest and develop a community around machine learning and AI in Hawaii

1. Host machine learning related **talks**
2. Machine learning **tutorials**
3. Machine learning **competitions**

What to Expect from this Meetup

Host machine learning related **talks**

- Primary role as organizers
- Invite members, academia, visiting experts to share knowledge
- Examples
  - **A day in the life of a data scientist (coming soon)**
  - Machine learning primer
  - How to become a Kaggle master
  - High performance computing in R/Python
  - Specific machine learning algorithms

Let us know if you have any suggestions

What to Expect from this Meetup

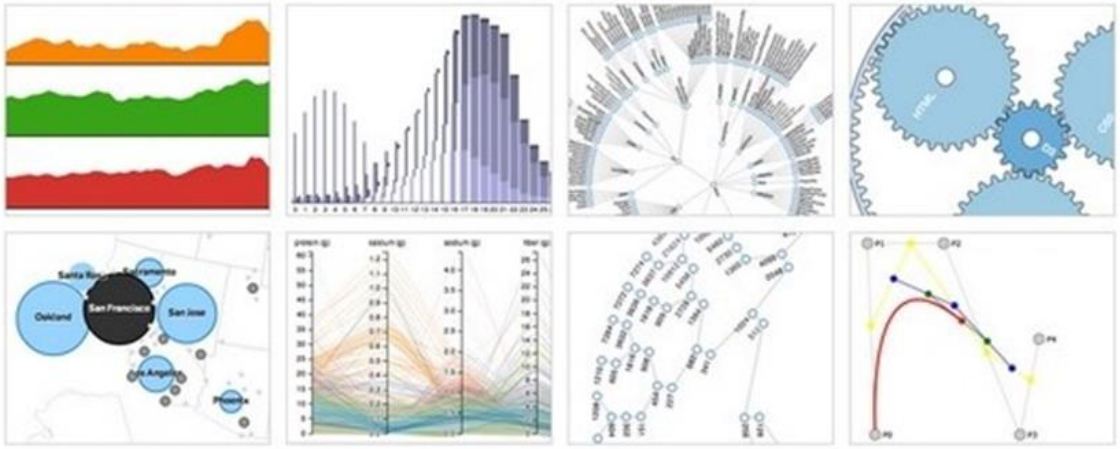
Machine Learning **Tutorials** (Study Group)

- Form study groups to leverage online resources
- Most resources are free
- Certifications are available

What to Expect from this Meetup

Machine Learning **Competitions**

- Host local competitions
  - Data visualization challenges
  - Predictive analytics challenges
- Team up in global competitions
  - [Kaggle]
  - [Numerai]



Passenger Screening Algorithm Challenge — **$1,500,000**
Improve the accuracy of the Department of Homeland Security's threat recognition algorithms — 239 teams
Featured · 3 months to go

Zillow Prize: Zillow's Home Value Prediction (Zestimate) — **$1,200,000**
Can you improve the algorithm that changed the world of real estate? — 2,634 teams
Featured · 4 months to go

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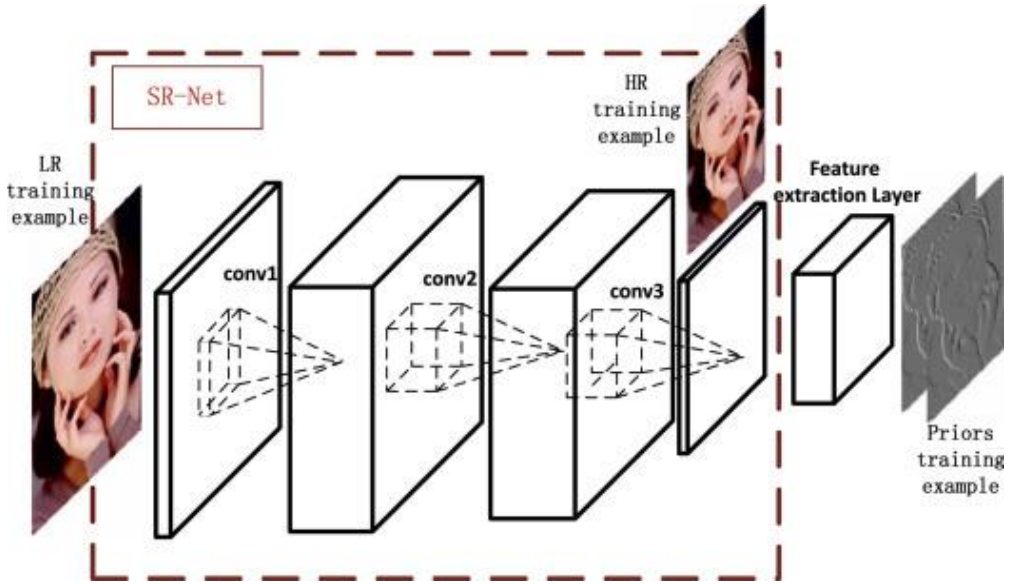
Human vs AI – Age Prediction

Compete against machine learning to predict member's age

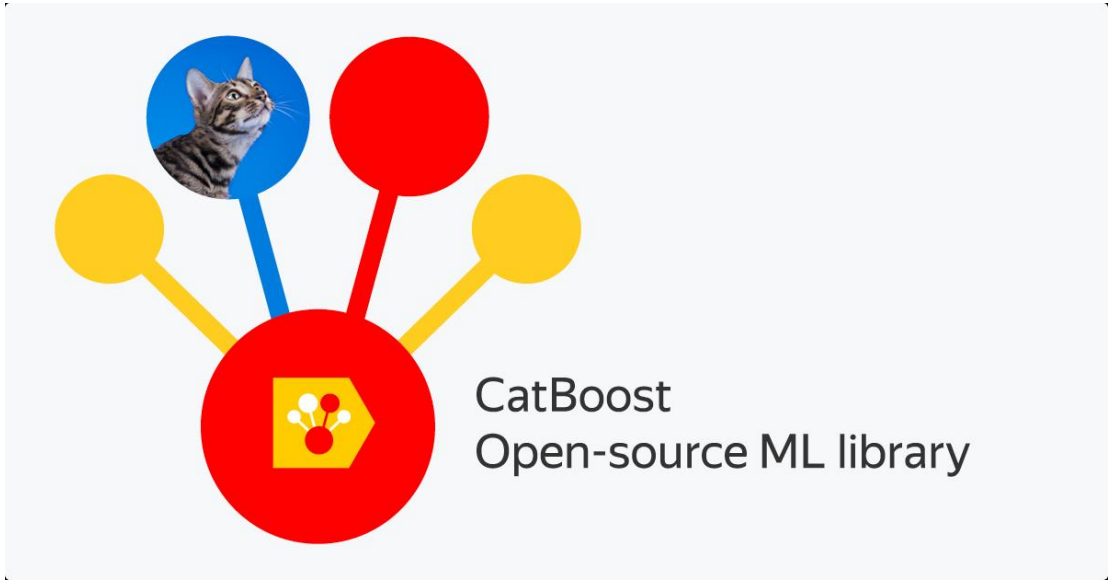
Convolutional Neural Network

IMDB-WIKI Dataset (500k+ facial images)



CatBoost

Speed Dating Data (2002-2004, 8000+ records)



Human vs AI – Age Prediction

On a scale of 1-10, how interested are you in the following activities?

1. Several times a week
2. Twice a week
3. Once a week
4. Twice a month
5. Once a month
6. Several times a year
7. Almost never

- Exercising
- Dining out
- Museums/galleries
- Hiking/camping
- Gaming
- Dancing/clubbing
- Reading
- Watching TV
- Movies

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We'll keep you posted

We are working out the details for

- New meetup location
- Upcoming meetup topics
- Hawaii machine learning website
- Recommended massive online open courses for machine learning

Thanks for Coming!