Harvard

Yá’át’ééh 👋

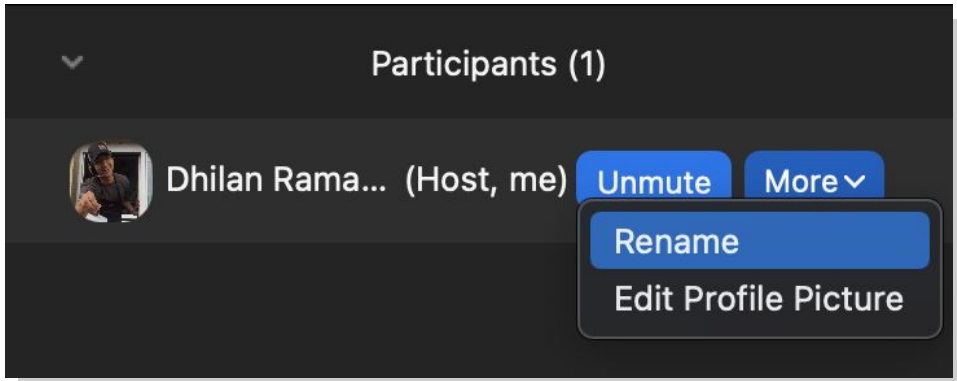
CRESTLEX 3.0

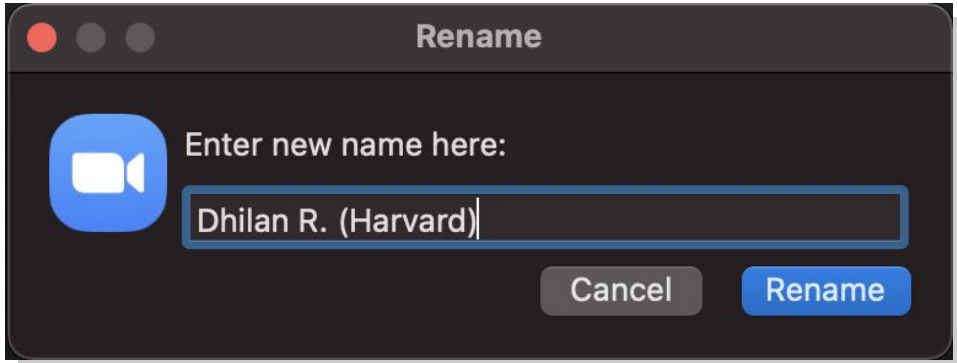
CReating **E**ffective **ST**em
Learning **EX**periences

with Navajo Tech

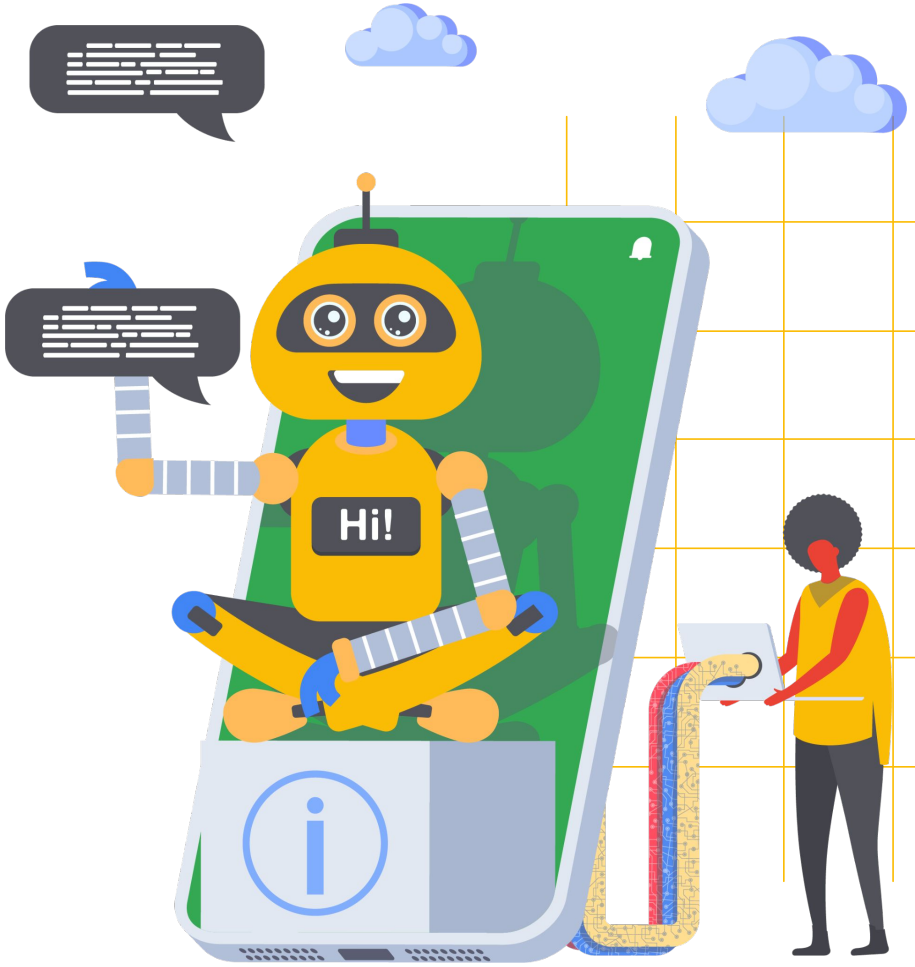
Using **Zoom**

- **Ask questions**
  - Use the Zoom chat
  - Raise your hand
  - Interrupt us!
- Cameras & Microphone
  - Camera on if you'd like
  - **Mic muted** unless speaking


Participants (1)
Dhilan Rama... (Host, me)
Unmute
More
Rename
Edit Profile Picture

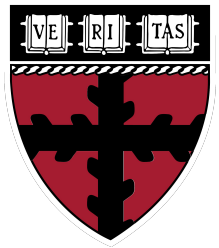

Rename
Enter new name here:
Dhilan R. (Harvard)
Cancel
Rename

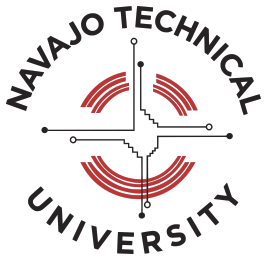
Harvard

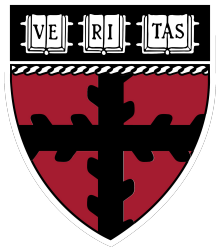


How ML works?

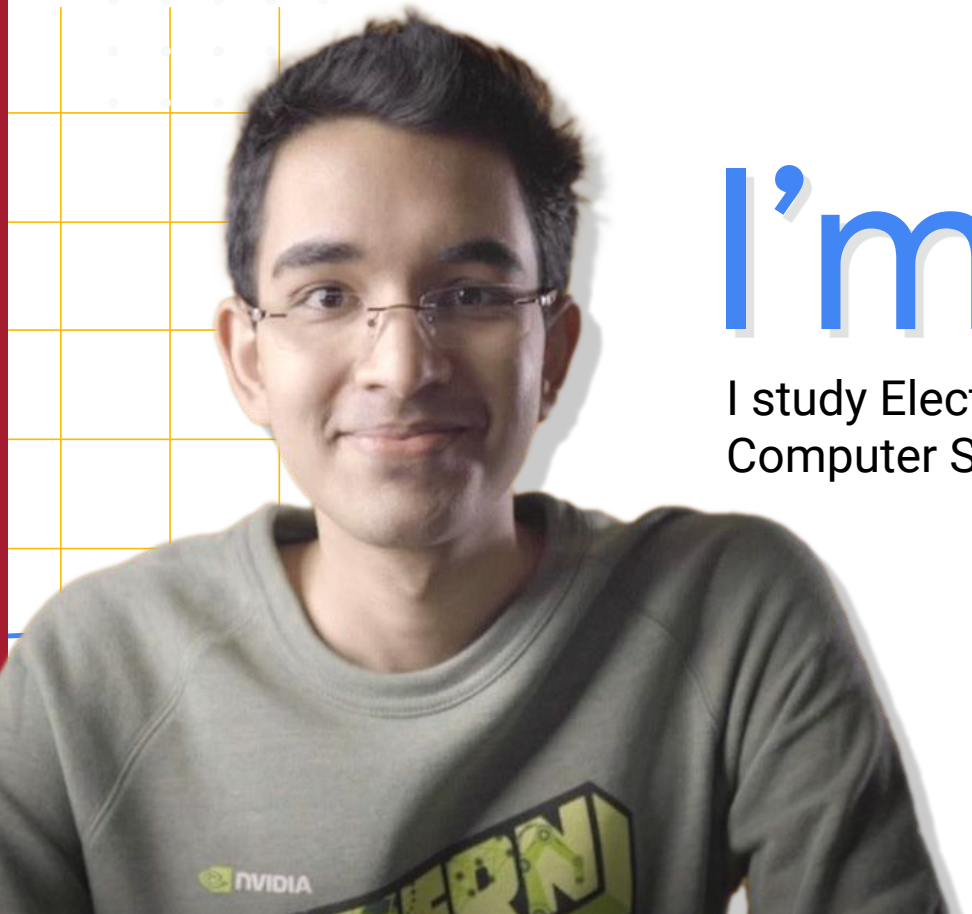
with Professor VJ


VE
RI
TAS


NAVAJO TECHNICAL
UNIVERSITY


VE RI TAS

NAVAJO TECHNICAL
UNIVERSITY



I'm Dhilan!

I study Electrical Engineering and Computer Science at **Harvard**.

review

from **yesterday**!

AI and ML for today and tomorrow...

Laurence Moroney
@lmoroney

Consider Activity Detection

```
if(speed<4){
    status=WALKING;
}
```

```
if(speed<4){
    status=WALKING;
} else {
    status=RUNNING;
}
```

```
if(speed<4){
    status=WALKING;
} else if(speed<12){
    status=RUNNING;
} else {
    status=BIKING;
}
```

```
// ???
```

```
01010010101001010101
10010101010010111101
01001010100101010010
01010010101001010101
```

Label = WALKING

```
10101001010010101010
01010100100100100001
00100111110101011111
10101001001111010111
```

Label = RUNNING

```
10010100111110101010
11010101110101011100
10101011110101010111
11111100011110101010
```

Label = BIKING

```
11111111110100111010
00111111010111110101
01011101010101011100
10101010101001111100
```

Label = GOLFING

```
01010010101001010101
10010101010010111101
01001010100101010010
01010010101001010101
```

Label = WALKING


```
10101001010010101010
01010100100100100001
00100111110101011111
10101001001111010111
```

Label = RUNNING


```
10010100111110101010
11010101110101011100
10101011110101010111
11111100011110101010
```

Label = BIKING


```
11111111110100111010
00111111010111110101
01011101010101011100
10101010101001111100
```

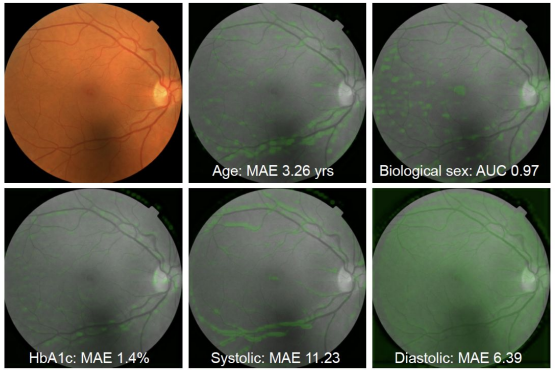
Label = GOLFING

```
model = keras.Sequential([keras.layers.Dense(units=1, input_shape=[1])])
model.compile(optimizer='sgd', loss='mean_squared_error')

xs = np.array([-1.0, 0.0, 1.0, 2.0, 3.0, 4.0], dtype=float)
ys = np.array([-3.0, -1.0, 1.0, 3.0, 5.0, 7.0], dtype=float)

model.fit(xs, ys, epochs=500)

print(model.predict([10.0]))
```



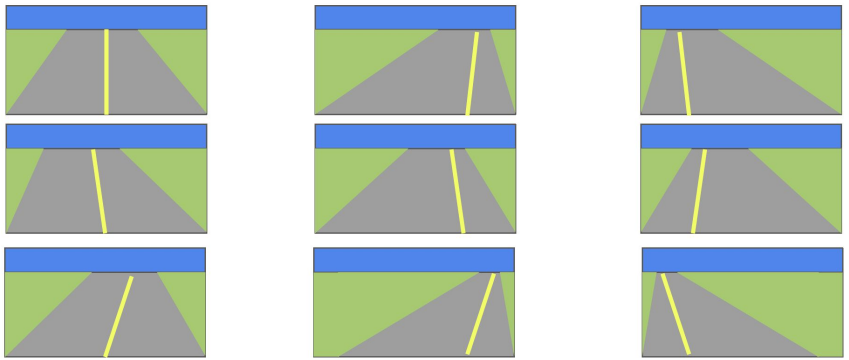
Predicting things that doctors can't predict from imaging

Potential as a new biomarker

Preliminary 5-yr MACE AUC: 0.7

Can we predict cardiovascular risk? If so, this is a very nice non-invasive way of doing so

Can we also predict treatment response?



Tips from **Laurence**

- Learn how to code in **Python**
- Build strong **data skills**
  - collecting data (gather)
  - cleaning data (format)
  - managing data
- Develop well-rounded **testing skills**
  - think about products as a **whole**
  - consider the **diversity** of your users

Laurence Moroney
@lmoroney

Harvard

Experimenting with AI

with Dhilan

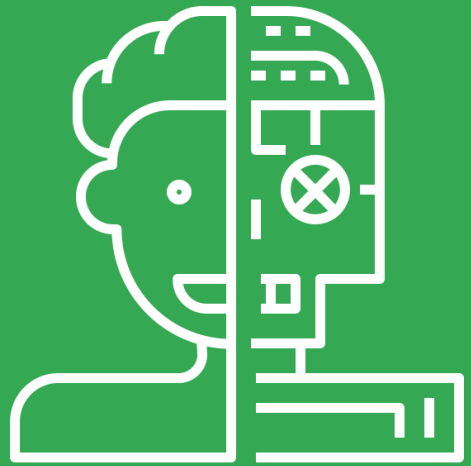
Artificial Intelligence

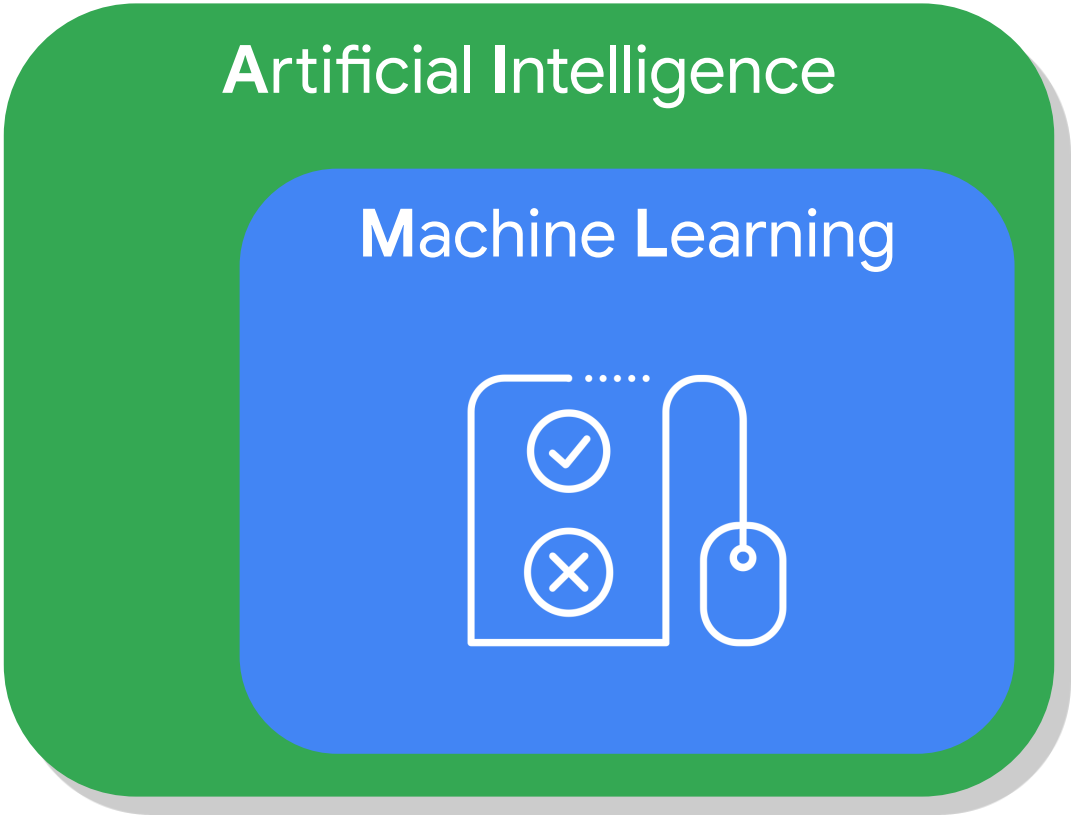
Machine Learning

What's the difference?

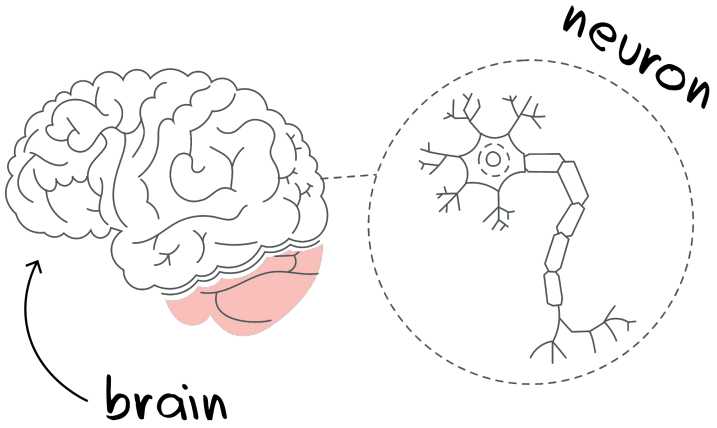
It’s all **connected**!

Artificial Intelligence




Artificial Intelligence
Machine Learning

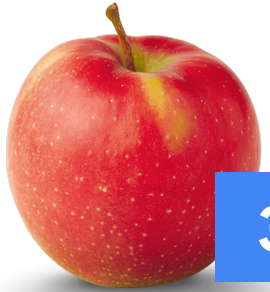
Human Intelligence



Categorize

1

2



3

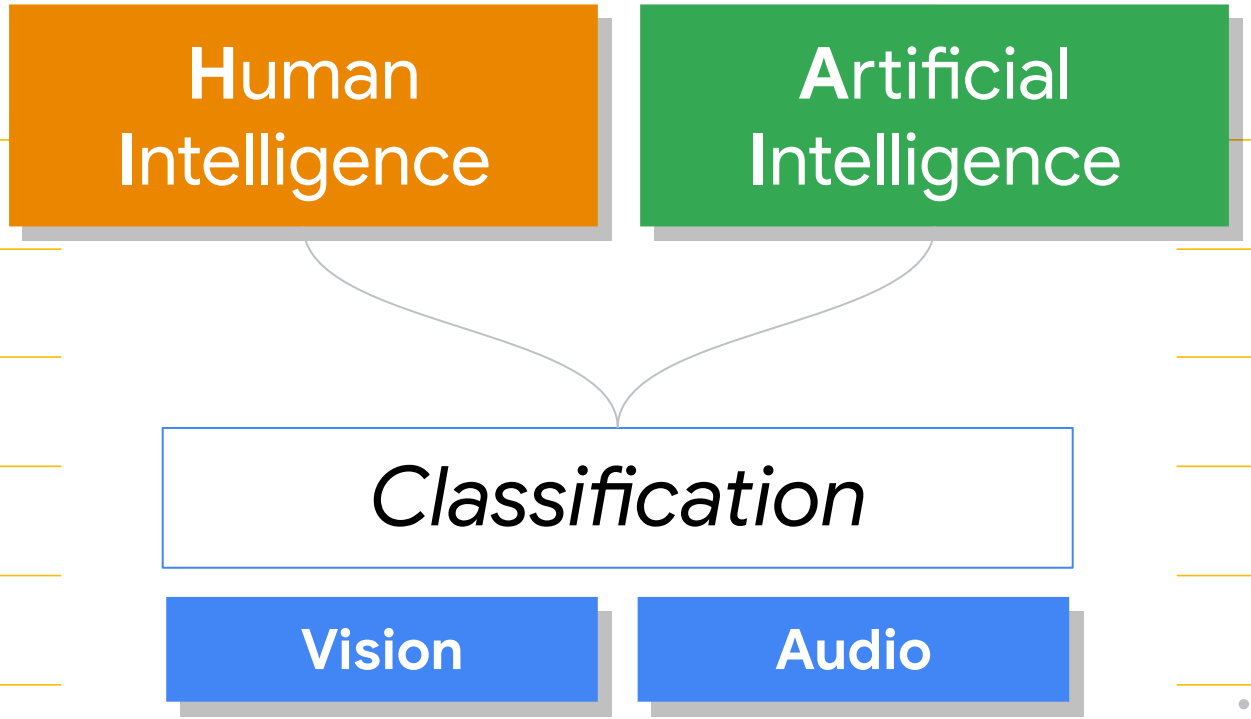
4

5

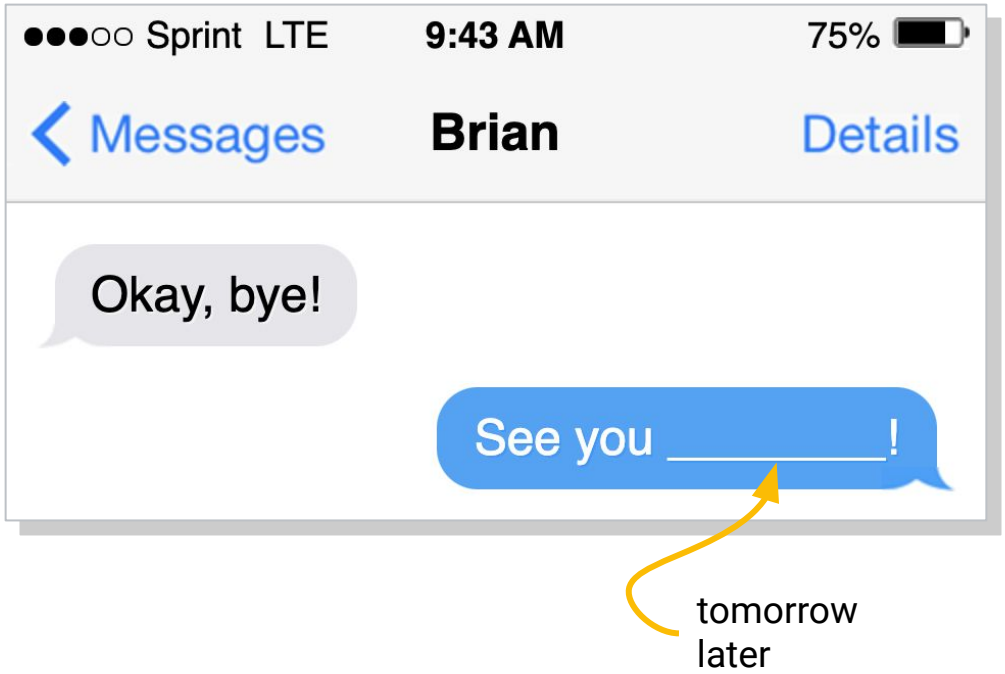
6

7

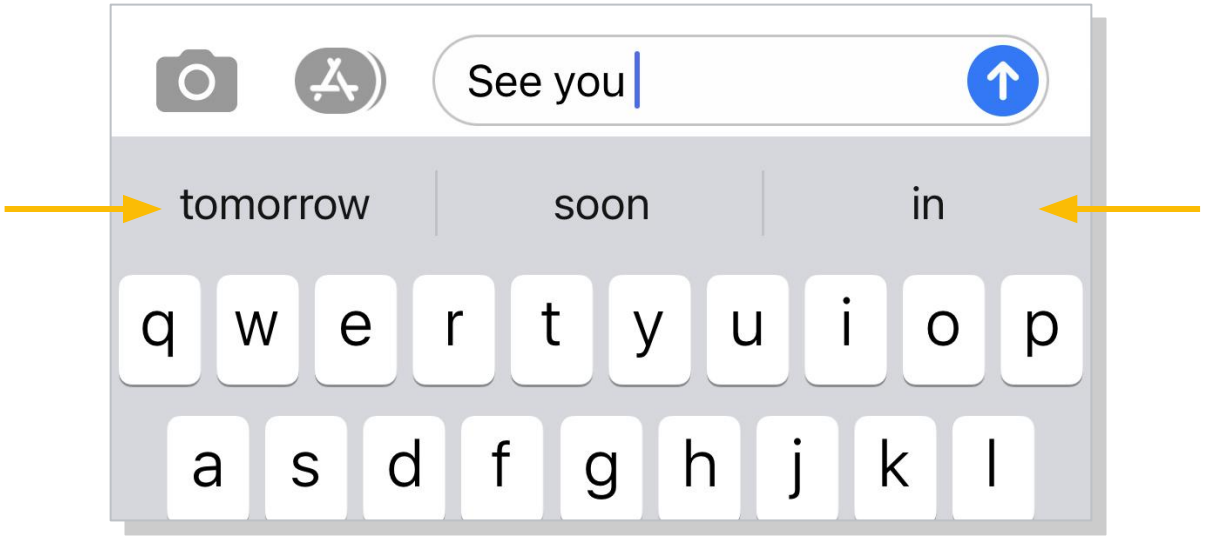
8

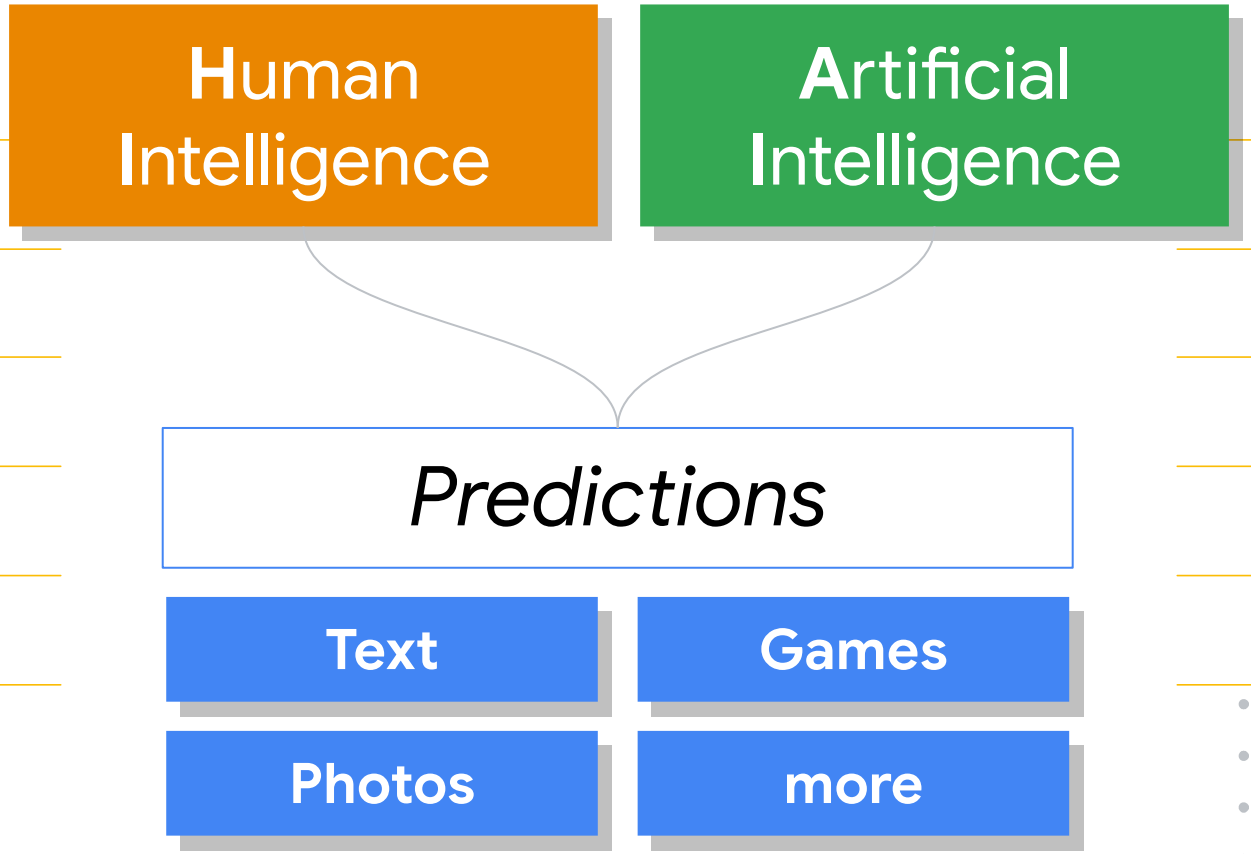

Human Intelligence
Artificial Intelligence
Classification
Vision
Audio

Fill in the blank



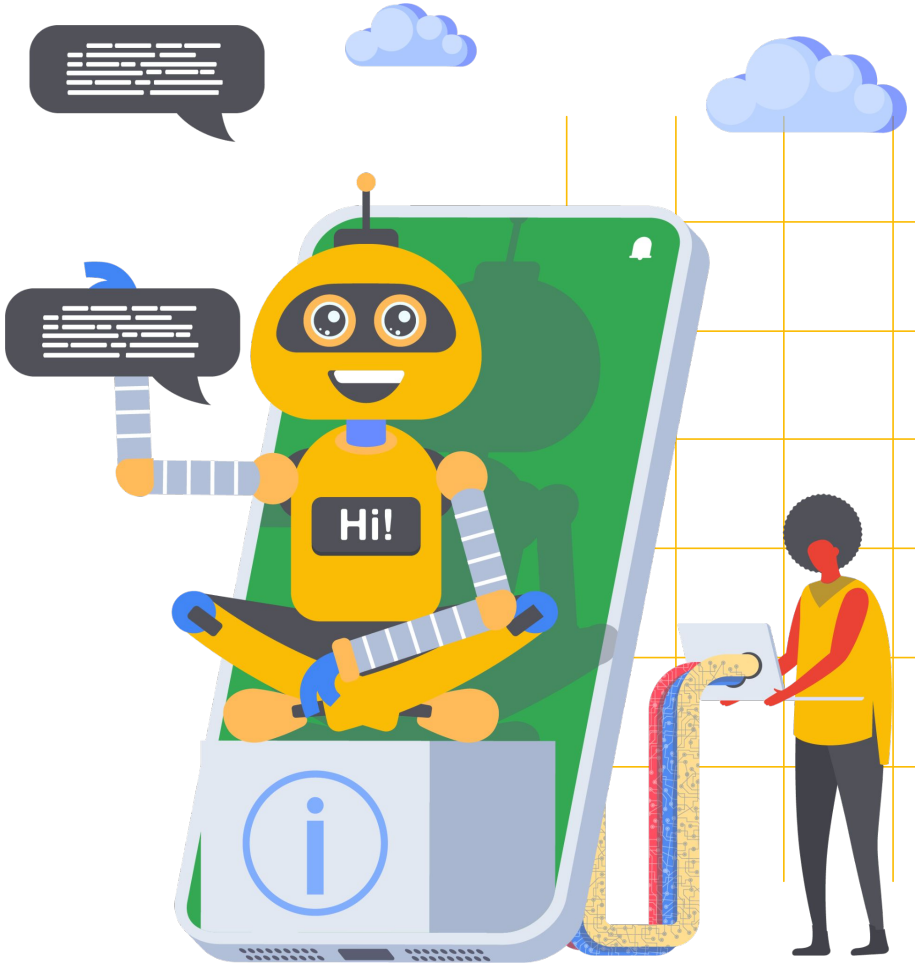
Prediction: autocomplete




Human Intelligence
Artificial Intelligence
Predictions
Text
Games
Photos
more

92.1%
67.0%
72.8%

Harvard



How ML works?

with Professor VJ