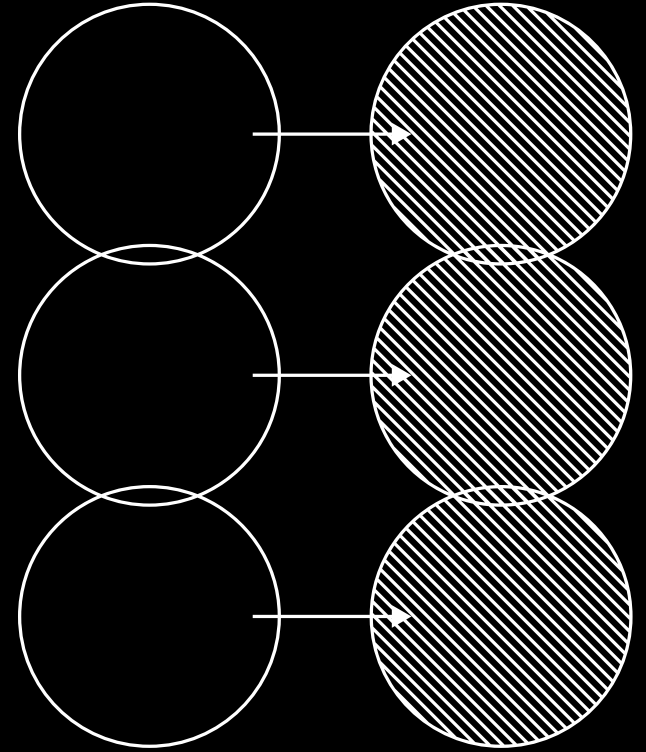


# MACHINE LEARNING



How does it work?

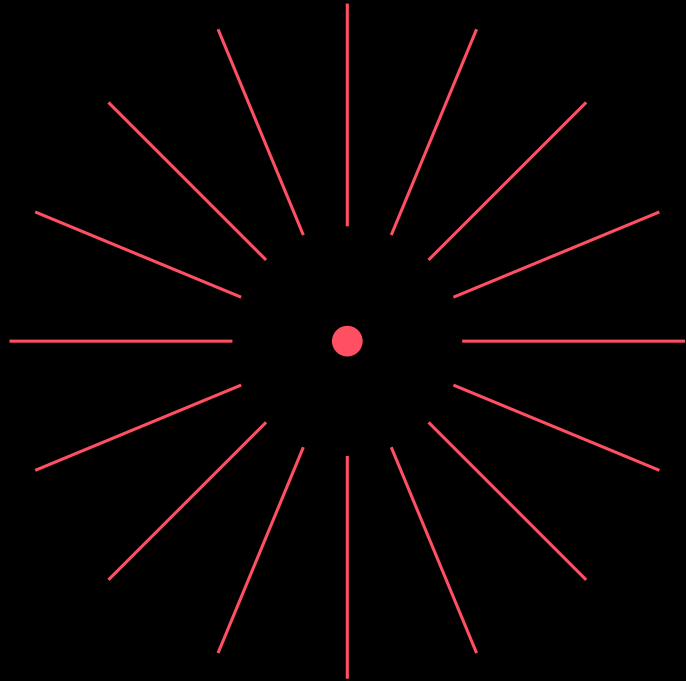
Stephanie D. Husby

# Who am I?

**Stephanie Husby, MSc., MBET**

- Chair of Technology @ NorQuest College
- Generalist
- Educator
- Mom





## What is machine learning?

A branch of artificial intelligence where machines *make predictions* based on patterns derived from *historical data*.

# Examples of machine learning



## Recommended for you

Netflix uses it to customize your experience.



## Watch out for traffic

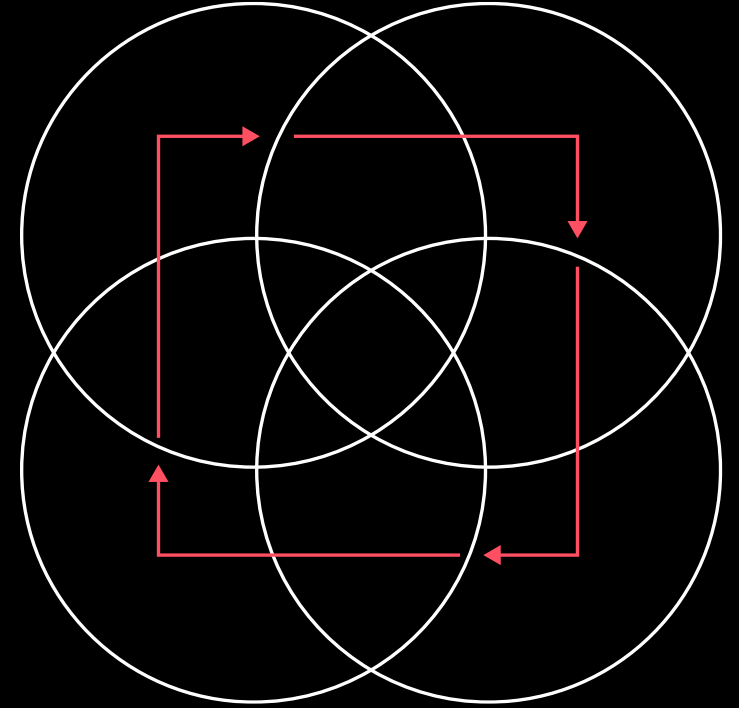
Google uses it to update you on traffic delays.

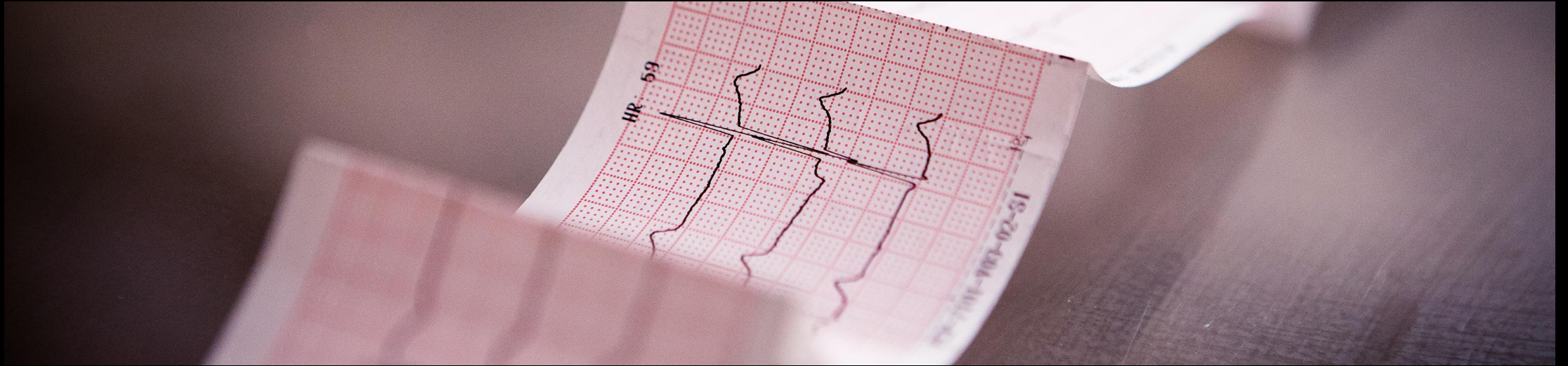


## Should I give you access?

Smart phones use it to confirm your identity.

But wait, **how**  
does it do all  
that?





# Data

**Machine learning needs data,  
a lot of it!**

**What kind of data?**

Depends on what you want to predict.

The more examples that look like what you want, and what you don't want, the better!



# Is your data **labelled**?

## Supervised Learning

- requires data to be labelled
- we have the ground truth



## Unsupervised Learning

- data is unlabeled
- ground truth is unknown



# Algorithms

**Step-by-step instructions for solving a class of similar problems.**

Training data is fed to an algorithm.

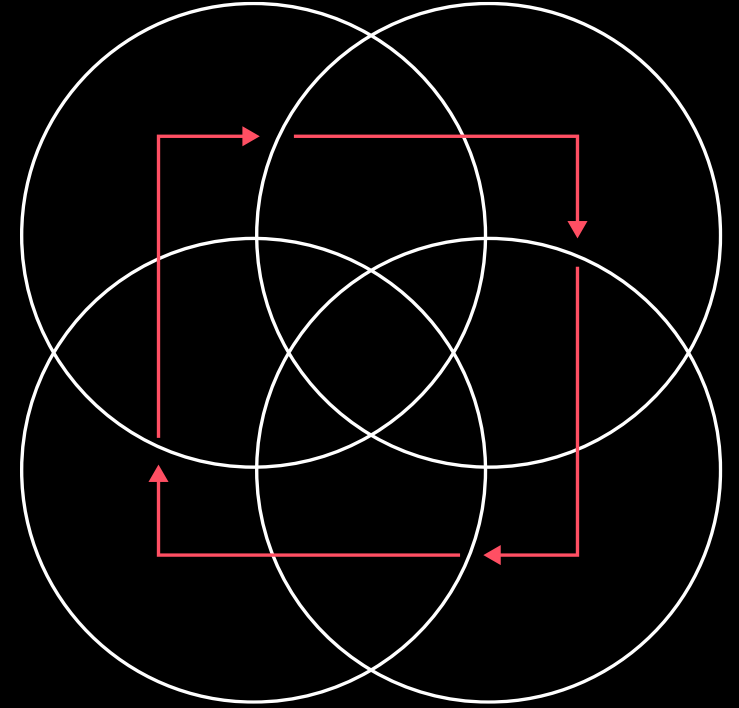
In machine learning there are hundreds- maybe thousands- of algorithms.

The goal of all ML algorithms is to find common patterns in the training data.





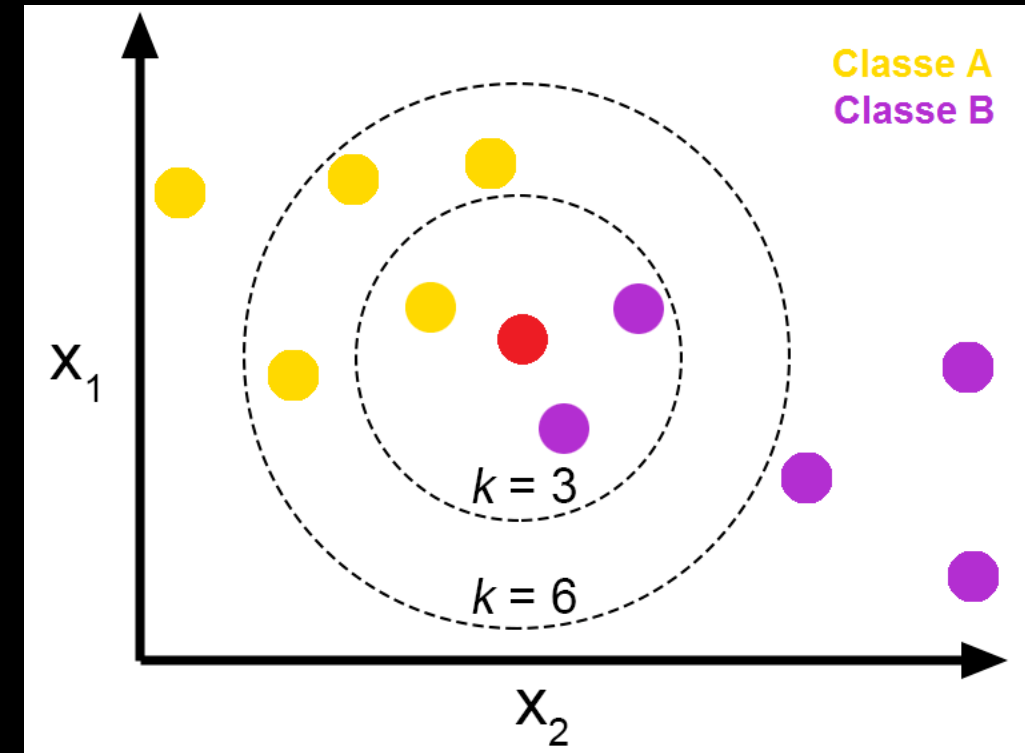
Let's look at  
one algorithm  
a little closer!



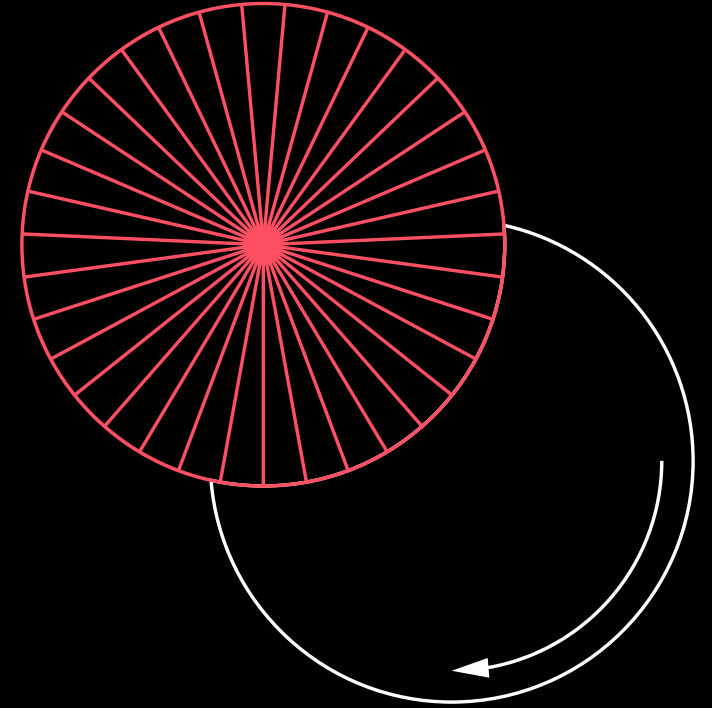
# K-Nearest Neighbours (kNN)

An algorithm that makes predictions by looking around at the other data points that are most similar.

*Typically, you would have many more data features ( $X_1$  &  $X_2$ )- but for visualization purposes, we use two here.*

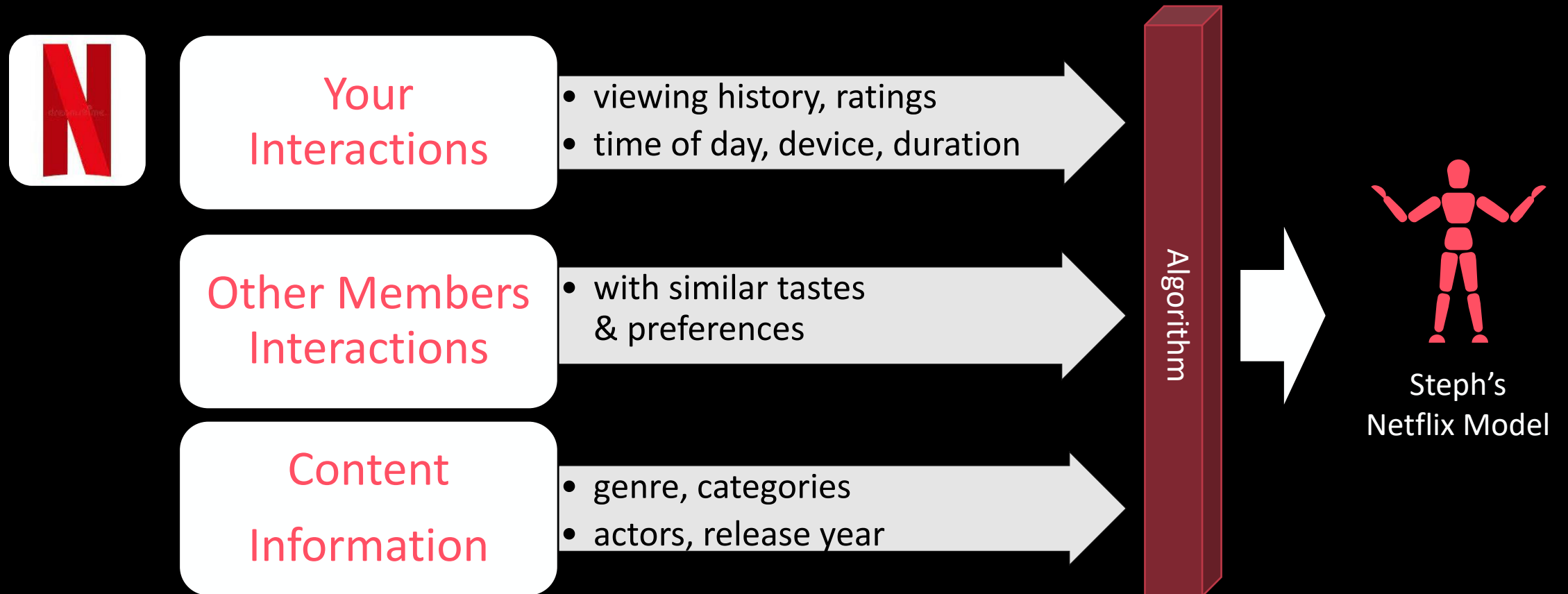


The output of the  
algorithm is a  
machine learning  
**model.**



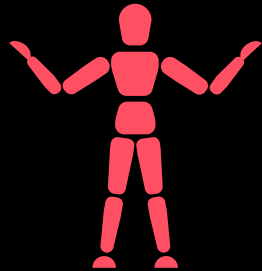
# What do you mean, **new data**?

Let's look at an example:

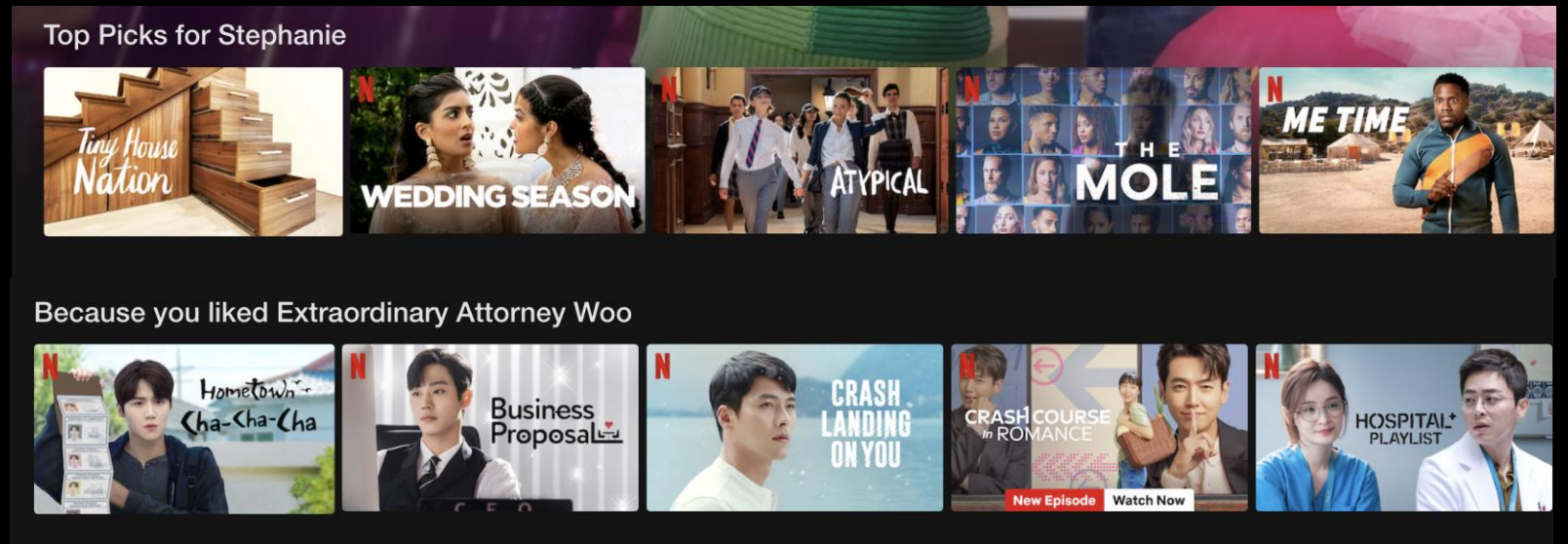


# What do you mean, **new data**?

Let's look at an example:



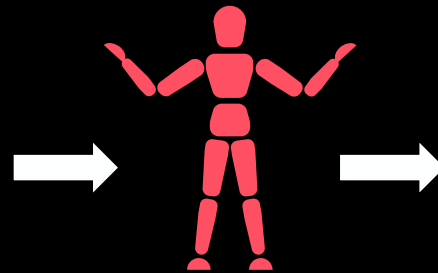
Steph's  
Netflix Model





# What do you mean, **new data**?

Let's look at an example:

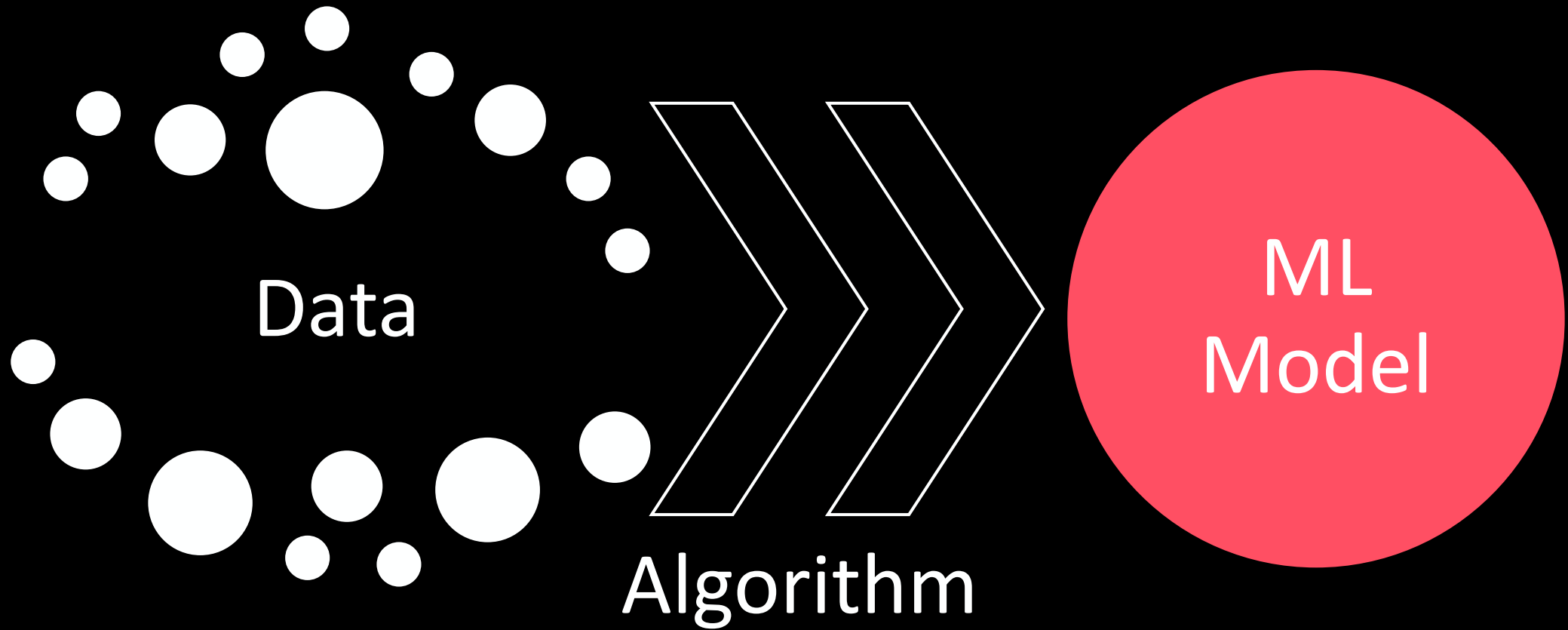


Steph's  
Netflix Model

**84%**

Likely to watch  
this show

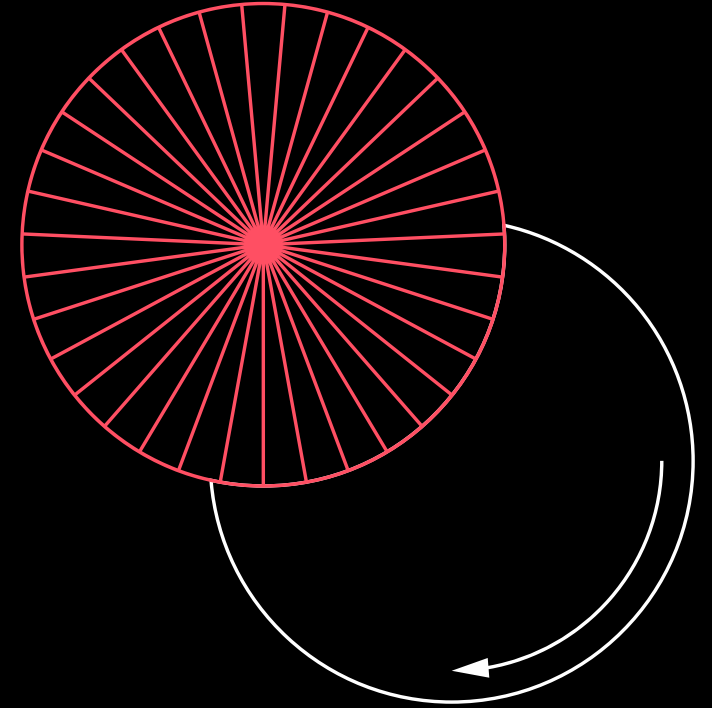
# Let's recap!



# Let's recap!



Thank you!  
Questions?



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