

# The Cold Start Problem

Joshua Bernhard

# The Cold Start Problem

- What is it?
- What are the challenges?
- What methods are used to combat?

# **The Cold Start Problem**

**What is it?**

# The Cold Start Problem

When there is a new item or user, it is difficult to make recommendations for these cases. This is the **cold start problem**.

# **The Cold Start Problem**

**What are the challenges?**

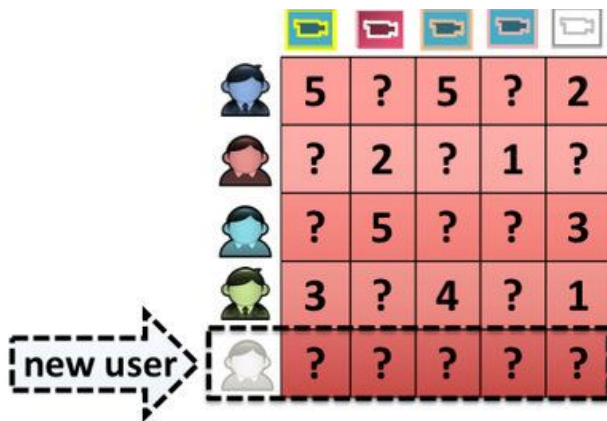
# The Cold Start Problem

How do we make a recommendation?

- Collaborative filtering has no comparisons to make
- Matrix factorization methods can't fill in completely empty rows or columns

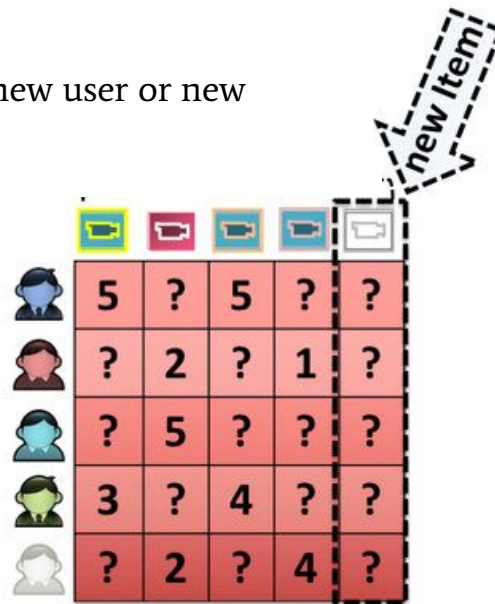
# The Cold Start Problem

How do we make recommendations for the new user or new item?



A diagram illustrating the cold start problem for a new user. It shows a 5x5 grid of red cells. The first four rows represent existing users, each with a colored icon above them. The fifth row represents a new user, indicated by a dashed arrow labeled "new user" pointing to a grey icon. The columns represent items, each with a colored icon above them. The grid contains the following values:

	5	?	5	?	2
	?	2	?	1	?
	?	5	?	?	3
	3	?	4	?	1
	?	?	?	?	?



A diagram illustrating the cold start problem for a new item. It shows a 5x5 grid of red cells. The first four rows represent existing users, each with a colored icon above them. The fifth column represents a new item, indicated by a dashed arrow labeled "new item" pointing to a grey icon. The grid contains the following values:

	5	?	5	?	?
	?	2	?	1	?
	?	5	?	?	?
	3	?	4	?	?
	?	2	?	4	?

# **The Cold Start Problem**

**What are the methods used to combat?**



# The Cold Start Problem - Users

There are two common methods for “handling” the cold start problem when there is a new user.

1. Give the new user just the most popular items as recommendations.
2. Determine which recommendations will provide the most information for recommendations in the future - Ex: one from each genre, or one from a bunch of seemingly independent item categories.

# The Cold Start Problem - Items

When you are working with new items, it can be difficult to balance the users who receive the new item as a recommendation. Some common methods:

1. Provide item to users where you will know quickly if a user likes it (quick response users).
2. Provide item to a small group of users, but who all have different preferences to try and find good group fit.

# Recap

- The cold start problem is one of the most common problems for all recommendation systems
- You learned how to spot the problem, and some common methods to deal with it:
  - Providing new users diverse items, and new items to diverse individuals can give a lot of information
  - When you aren't sure what to do, providing most popular items to a new users or the most active users a new item are common (and often easy to implement) methods of handling the cold start problem