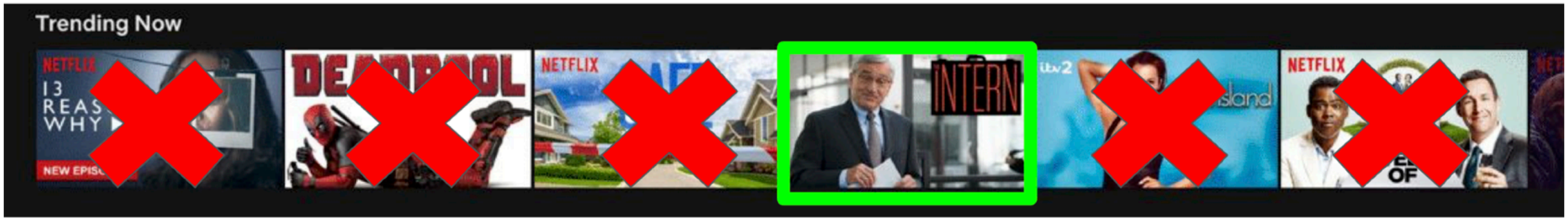
Learning from paired comparisons

Query the user with paired comparisons

"Do you prefer item $\mathbf{x_i}$ *or* $\mathbf{x_j}$*?"*

+ Easy for humans to respond to [1, 2]

+ Responses available implicitly



[1] Miller. (1956)

[2] David. (1963)

Distance-based preference models

- Items $\mathbf{x}_1, \ldots, \mathbf{x}_N \in \mathbb{R}^D$
- User's *ideal point* $\mathbf{u} \in \mathbb{R}^D$
- The closer an item $\mathbf{x}_i$ is to ideal point $\mathbf{u}$ under *some distance metric,* the more preferred $\mathbf{x}_i$ is.
- ***Goal:*** Estimate unknown $\mathbf{u}$
  - Existing work (e.g., [3, 4, 5]): ***standard Euclidean*** metric