A User-Centric Approach to the Design and Consequences of Recommender Systems

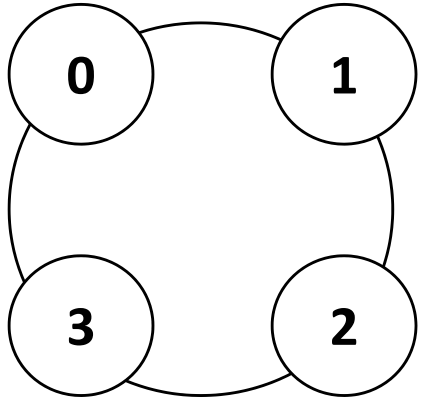
Guy Aridor, Duarte Gonçalves, Shan Sikdar

How do recommender systems affect: (1) **filter bubbles** and (2) **user homogenization**

- Empirically observed filter bubbles *without recommendation* (Nguyen et al., 2014): why?
- Concern that recommender systems may worsen situation

Model

- Users **uncertain** about their valuation of products
  value = idiosyncratic + common components
- **(Bayesian) learning by consuming**: one product consumer per period; finite horizon T; normally distributed values
- **Spillovers**: valuation of products correlated; higher *correlation* for nearby/more *similar* products



Contrast **No Recommendation** to

- **Recommendation**: provide information on expected values given past consumption values and other users' valuation
- **Oracle**: ex-post optimal consumption path
- Evaluation: simulation on grid of parameter values (e.g. horizon, number of products, correlation)

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Filter Bubbles

- **No Recommendation**: filter bubble effect; negative correlation between welfare and diversity
- **Recommendation**: *mitigates filter bubbles*; no correlation between welfare and diversity

User Homogeneity

- **No Recommendation**: lower coordination than optimal (oracle); idiosyncratic consumption paths
- **Recommendation**: higher coordination than optimal; over-exploitation of other users' preferences