Given decades of post-PhD career trajectory data, what can we learn about the evolution of careers in computing research at the levels of individuals, organizations, and sectors?

Motivations
- CS research careers are important but not well-studied
- Career analysis models generalize to other fields
- Analysis can inform employer recruitment/retention

Typical model: Transition network
- Nodes: Organizations
- Edges: Directed, weighted by flow volume between orgs

Proposed network model
- \( R^2 \): Resources, Retention, Relative growth
- Transforms edge weights with career-specific factors
- HITS [1] node ranking on the \( R^2 \) network identifies:
  - Hubs: Employer “producers”
  - Authorities: Employer “consumers”

1. System-wide evolution
   - Compute HITS in 5-yr intervals on transition and \( R^2 \) networks
   - Regress pairs of HITS scores, identify highest deviations in the top 50 hubs/authorities

2. Cross-sector career movement
   - Compute HITS in 5-yr intervals on transition and \( R^2 \) networks
   - While 2/3 of cross-sector transitions are academia \( \rightarrow \) industry, there’s significant asymmetry in transition patterns

3. Individual retention prediction
   - Will an individual transition within the next \( n \) years?
   - Features extracted from individual career trajectory (IND), transition network \( (G_f) \), and \( R^2 \) network \( (R^2) \)

Data
- 1970 – 2015: \( \sim 7k \) PhDs in EECS, 17+ records
- Top 50 US computer science graduate programs
- Profiles validated by ProQuest
- We made 2 datasets public: [http://bit.ly/2M6InO](http://bit.ly/2M6InO)

References and Acknowledgments

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