Social Networks in Digital Art

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Agenda

1. Quantifying reputation and success in art
   a. Topic & Applications
   b. Data
   c. Methods
   d. Results
   e. Conclusions
   f. Evaluation

2. Importance of social networks in digital art
   a. Hypothesis
   b. Data
   c. Software & Methods
   d. Results
   e. Conclusions
   f. Takeaways
Quantifying reputation and success in art

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Topic & Applications

- Value of art vs. value of artist
- Qualitative nature of art popularity
- Institutional effects
- Measure artistic career trajectory
- Model for artist success
Data

- Dataset from Magnus
  - Roughly 500,000 artists
  - N = 9392 institutions ranked A to D
  - 36 years of data

- Key assumptions
  - Institution prestige is objective and largely static over time
  - Exhibited artists vs. artworks exhibited
Methods

● Graph development
  ○ Node: museums and galleries
  ○ Edge: movement of artist’s work, directed
● Artists grouped by prestige of first 5 exhibits
● Simulation of careers based on dataset facts
Results

- Probability an artist moves from previous exhibition to new exhibition gives memory term $\mu$:

$$
\mu[\pi_{i+1}; m_\tau] = \frac{p[\pi_{i+1}, m_\tau]}{p[\pi_{i+1}]}
$$

- Where $m_{\tau\tau}$ is average reputation, representing average exhibition prestige

$$
m_\tau = \frac{1}{\tau} \sum_{k=1}^{\tau} \pi_{i-k+1}
$$
Observed

Data

A

Prestige ($\pi$)

0.0
0.2
0.4
0.6
0.8
1.0

Time (Years)

0
5
10
15
20

All Artists
High Initial Reputation
Low Initial Reputation

C

Memory Model

Prestige ($\pi$)

0.0
0.2
0.4
0.6
0.8
1.0

Time (Years)

0
5
10
15
20

All Artists
High Initial Reputation
Low Initial Reputation
Conclusions

- Low previous reputation → 17x higher likelihood of low prestige institution next, opposite 42x
- Past 12 exhibitions offer optimal memory for future prediction
- Artists who break through low reputations do so in the first 10 years of their career
- More distinct institutions generally correlates with better trajectory
- Artist’s talent uncorrelated with country of origin, but some countries have better access to the art network
Evaluation

● Succeeds in codifying art success

● Bias
  ○ Dataset bias (noted as negligible)
  ○ Underrepresentation of non-object art

● Repeatability
Importance of social networks in digital art
Hypothesis

- **Key differences**
  - Importance of social networks/artists as opposed to institutions
  - Digital art is quantifiable, focus on relations

- **Scope limitation**
  - Single website, deviantArt.com
  - Snapshot as opposed to trajectory
  - Proof-of-concept

If a digital artist is “watched” by people with more popular portfolios, then said artist’s creations will be more popular.
Data

- **deviantArt API**

- **Key factors**
  - Node: artist
  - Node weight: popularity
  - Directional edge: “is watching” artist, i.e. follows

- **Dataset**
  - Approximately 200,000 artists considered
  - Initial “seed artists” could create bias
  - “Popularity” = average favorites on 24 newest submissions
  - Artists below popularity threshold (5000) discarded
Software & Methods

- **Data collection**
  - Python
  - API, web scraping

- **Network visualization**
  - Gephi

- **Qualitative analysis**
  - Clique identification
  - Cross-discipline interaction
  - Usage of platform
Results
Conclusions

● Proof-of-concept for determining social impact on digital art popularity

● Initial hypothesis disproved (qualitative)
  ○ Quantity of followers > quality of followers
  ○ High-popularity artists follow fewer artists on average, little overlap between upper echelon
  ○ Higher “following” count could be indicative of the user being an amateur artist looking for inspiration
  ○ High-popularity artists shift from “user” to “influencer,” using the site to build a social network and gain popularity

● More data needed for further analysis
Takeaways

- Hangups with data collection
- Collect multiple data snapshots
  - Artist popularity over time
  - Shift of social networks
- Multiple websites
- Virality
- Categorization