Can we use the network structure of online design communities to measure the relative importance of designs and users?

**MOTIVATION**

On the Web …
Not all links are equal

In design networks …
Not all likes are equal

The importance of a design is influenced by the importance of its creators and promoters, and vice versa.

**MODEL AND ALGORITHM**

**Induced Graphs**

- Original graph
- Induced user graph
- Induced design graph

**Iterative Algorithm**

\[
U = \text{DiagZero}(\alpha_1 C \text{diag}(r_d) C^T + \alpha_2 C \text{diag}(r_u) C^T + \alpha_3 \text{diag}(r_d) C^T + \alpha_4 \text{diag}(r_d) L^T) \\
\]

\[
r_u = \text{PageRank}(U) \\
\]

\[
r_d = \text{PageRank}(D) \\
\]

\[
D = \text{DiagZero}(\beta_1 C^T \text{diag}(r_u) C + \beta_2 C^T \text{diag}(r_u) L + \beta_3 L^T \text{diag}(r_u) C + \beta_4 L^T \text{diag}(r_u) L) \\
\]

**EXPERIMENTAL RESULTS**

Crawled 100 designs from 68 creators with 1009 likes and 2524 promoters.

The number of likes and ranks are positively correlated.

Significant shifts in the rank of individual designs.

**FUTURE WORK**

- Extend model to account for additional social networks features
- Learn model parameters from data
- Prove convergence
- Identify correlations between rank and design properties
- Develop mechanisms to identify and reward different types of users