

Board-Game-Graphs

Turning connectivity into insight





The problem?

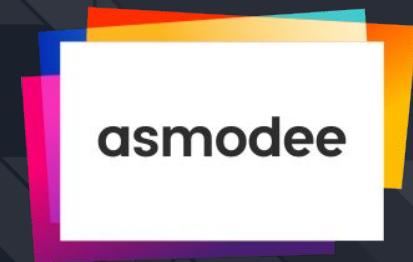
The global tabletop game industry is currently valued at **9.3 billion** US \$, it is projected to rise to **12 billion** US \$ by 2023*

Companies like Kickstarter have enabled independent designers to enter the market

Independent designers don't have the marketing resources of the larger publishers

* Statista. Retrieved 2020-01-23

- Our Board-Game-Graph levels the playing field
- We're here to help independent designers reach their full audience
- By finding types of board game that are similar to each other we can connect common consumers via intermediary game types



Three Steps to a Board-Game-Graph

1

Gather data on board game mechanics and popularity

2

Embed data into lower dimensional space and perform clustering

3

Create constellations of games and analyse them



Data Collection



Every game on BoardGameGeek ~ 90,000 +

135 Binary metrics about game mechanics and theme

Current user ratings scraped from BoardGameGeek (16/01/20)

8.9 Gloomhaven (2017)
32K Ratings & 6K Comments - GeekBuddy Analysis

1–4 Players	60–120 Min	Age: 12+	Weight: 3.81 / 5
Community: 1–4 — Best: 3	Playing Time	Complexity Rating	1 4 5 6

Designer: Isaac Childres
Artist: Alexandre Elichev, Josh T. McDowell
Publisher: Cephalofair Games + 8 more

REIMPLEMENTED: PANDEMIC
REIMPLEMENTED BY: PANDEMIC LEGACY

8.6 Pandemic Legacy: Season 1 (2015)
35K Ratings & 5.5K Comments - GeekBuddy Analysis

2–4 Players	60 Min	Age: 13+	Weight: 2.83 / 5
Community: 2–4 — Best: 4	Playing Time	Complexity Rating	1 4 5 6

Designer: Rob Daviau, Matt Leacock
Artist: Chris Quilliams
Publisher: Z-Man Games, Inc. + 10 more

REIMPLEMENTED BY: TERRAFORMING MARS

8.4 Terraforming Mars (2016)
49K Ratings & 7.3K Comments - GeekBuddy Analysis

1–5 Players	120 Min	Age: 12+	Weight: 3.23 / 5
Community: 1–4 — Best: 3	Playing Time	Complexity Rating	1 4 5 6

Designer: Jacob Fryxellus
Artist: Isaac Fryxelus
Publisher: FryxGames + 19 more

8.5 Through the Ages: A New Story of Civilization (2015)
18K Ratings & 2.7K Comments - GeekBuddy Analysis

2–4 Players	120 Min	Age: 14+	Weight: 4.39 / 5
Community: 2–4 — Best: 4	Playing Time	Complexity Rating	1 4 5 6

Publisher: Czech Games Edition + 12 more

REIMPLEMENTED: BRASS: LANCASHIRE

8.5 Brass: Birmingham (2018)
15K Ratings & 3.5K Comments - GeekBuddy Analysis

2–4 Players	60–120 Min	Age: 14+	Weight: 3.92 / 5
Community: 2–4 — Best: 4	Playing Time	Complexity Rating	1 4 5 6

Designer: Gavan Brown, Matt Tolman, Martin Wallace
Artist: Lina Cossette, David Forest, Damien Namolinski
Publisher: Roxley + 7 more

REIMPLEMENTED: TWILIGHT IMPERIUM (THIRD EDITION)

8.7 Twilight Imperium (Fourth Edition) (2017)
9.5K Ratings & 1.5K Comments - GeekBuddy Analysis

3–6 Players	240–480 Min	Age: 14+	Weight: 4.20 / 5
Community: 3–6 — Best: 6	Playing Time	Complexity Rating	1 4 5 6

Designer: Dane Beltrami, Corey Konieczka, Christian T. Petersen
Artist: Scott Schomburg
Publisher: Fantasy Flight Games + 9 more

8.3 Twilight Struggle (2005)
37K Ratings & 8.1K Comments - GeekBuddy Analysis

2 Players	120–180 Min	Age: 13+	Weight: 3.57 / 5
Community: 2 — Best: 2	Playing Time	Complexity Rating	1 4 5 6

Designer: Ananya Gupta, Jason Matthews
Artist: Viktor Csere, Roger B. MacGowan, Chechu Nieto, Guillaume Ries, Mark Simonitch
Publisher: GMT Games + 11 more

REIMPLEMENTED: STAR WARS: REBELLION

8.4 Star Wars: Rebellion (2016)
18K Ratings & 3.8K Comments - GeekBuddy Analysis

2–4 Players	180–240 Min	Age: 14+	Weight: 3.69 / 5
Community: 2 — Best: 2	Playing Time	Complexity Rating	1 4 5 6

Designer: Corey Konieczka
Artist: Matt Alliopp, David Ardila, Balaskas, Tiziano Baracchi + 43 more
Publisher: Fantasy Flight Games + 8 more

REIMPLEMENTED: TERRA MYSTICA

8.5 Gaia Project (2017)
12K Ratings & 1.8K Comments - GeekBuddy Analysis

1–4 Players	60–150 Min	Age: 12+	Weight: 4.31 / 5
Community: 1–4 — Best: 3–4	Playing Time	Complexity Rating	1 4 5 6

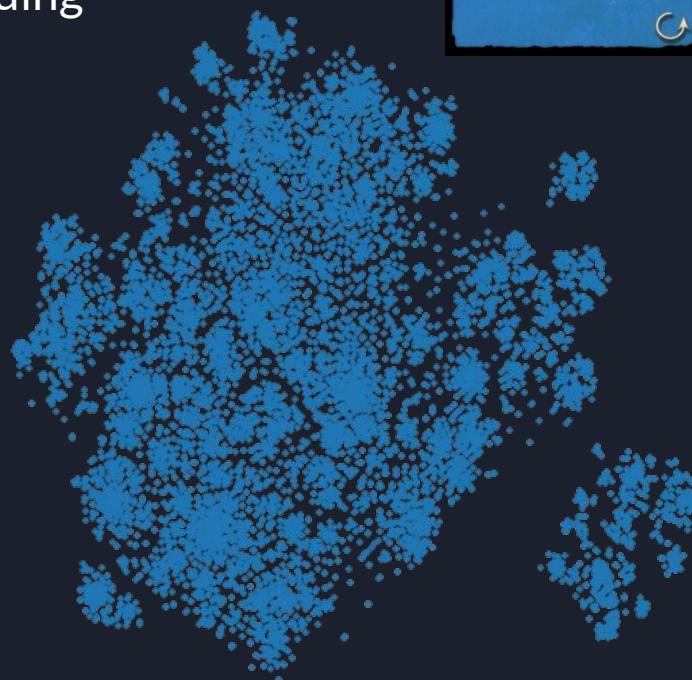
Designer: Jens Drögemüller, Helge Ostertag
Artist: Dennis Lohausen
Publisher: Feuerland Spiele + 12 more

Dimensional Reduction

t-distributed Stochastic Neighbour Embedding

Go from many dimensions to 2

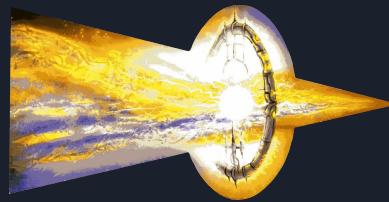
Easier to get meaningful clusters in 2D



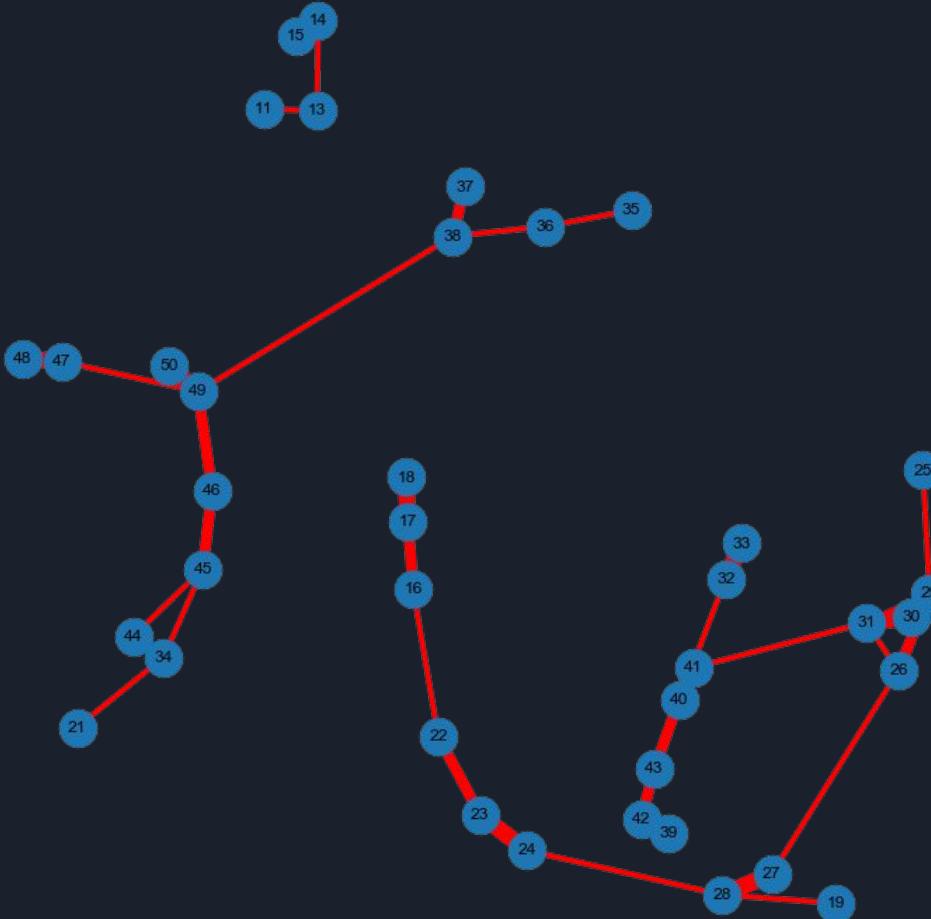


Finding the Links

Take 2D clusters and links neighbouring ones



What does the constellation tell us?



14: Deception/traitor deduction games

15: Quick social deduction games

11: Flicking/Dexterity games

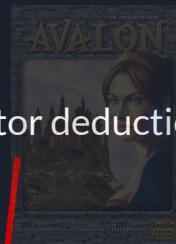
13: Drawing/Guessing party games



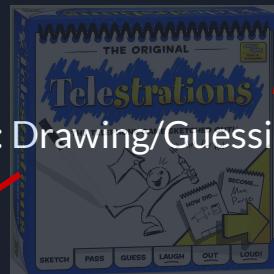
A user's game belongs in class 14
so we target class 15 then class 13



15: Quick social deduction games



14: Deception/traitor deduction games



13: Drawing/Guessing party games



Future Steps

More graph theoretic analysis : display the shortest distances between nodes

Train a board game classifier so that new games can be added to the clusters

Test the robustness of the pipeline by passing non-board game data through



Thanks for Listening!

Any Questions?





References

[1]: Kobak, Dmitry, and Philipp Berens. "The art of using t-SNE for single-cell transcriptomics." *Nature communications* 10.1 (2019): 1-14.

[2]: Shekhar, Karthik, et al. "Comprehensive classification of retinal bipolar neurons by single-cell transcriptomics." *Cell* 166.5 (2016): 1308-1323.

[3]: Eldridge, Justin, Mikhail Belkin, and Yusu Wang. "Beyond hartigan consistency: Merge distortion metric for hierarchical clustering." *Conference on Learning Theory*. 2015.