



**Problem:** No one likes buying a game and then having it sit on your shelf because no one wants to play it

With so many different group preferences, why make future boardgame purchases blind?



# Data! Meet the Facebook/Reddit of Boardgames



0 new  
0 new  
Next: dplondon

Board Games ▾ RPGs Video Games Events Logout Quickbar: 1 2 3 4 5 6 7 8 9 10 | Edit  
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SEARCH Board Game Go Adv. Search

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**Recently Viewed**

- Arkham Horror:
- Dunwich Horror Expansion
- Landyland
- Bohnanza
- Eldritch Horror
- SeaFall
- Pandemic Legacy
- Achaia
- DVONN
- StarCraft: The Board Game
- Twilight Struggle

[All ▾]

**Announcements**

- 71 Geek of the Week Geek Sánchez (Cinedeau)
- 161 News New Dice Images
- 35 Podcasts & Blogs New GameNight! Se3 Ep1
- 90 BGG News Huge BGG . live! [Page 1,2,3]
- 63 BGG.CON Spring Announcement Registration now open
- 221 BGG News We need your game page design!
- 20 BGG@SEA BGG@SEA
- 20 BGG@SEA BGG@SEA

**Sponsored Content**

- 196 Gamewright "Cube City" [Page 1,2]
- 233 Portal Games "Essen Spiel 20th!" [Page 1,2,3]
- 256 Matagot/Asmodee "Epic" [Page 1,2,3]
- 248 Fireside Games "The Village Crone" Contest! Ends Sept. 15th! [Page 1,2,3]
- 227 Mage Company "Essen Spiel 2015" Contest! Expired. [Page 1,2]

**Database**

- Games (79527)
- Categories (84)
- Artists (12809)
- Publishers (15648)
- Honors (2740)
- Gone Cardboard
- Families (2300)
- Mechanics (51)
- Designers (21871)
- Accessories (840)
- Random Game

**User Submitted Content**

- Files
- Reviews
- Videos
- Images
- Session Reports
- Blogs

**Podcasts**

- Podcasts
- Podcast Episodes

**Contest Results**

- 77 Mage Company "Essen Spiel 2015" Contest! WINNERS! chaddyboy\_ 27

**ESSEN SPIEL PREVIEW!**

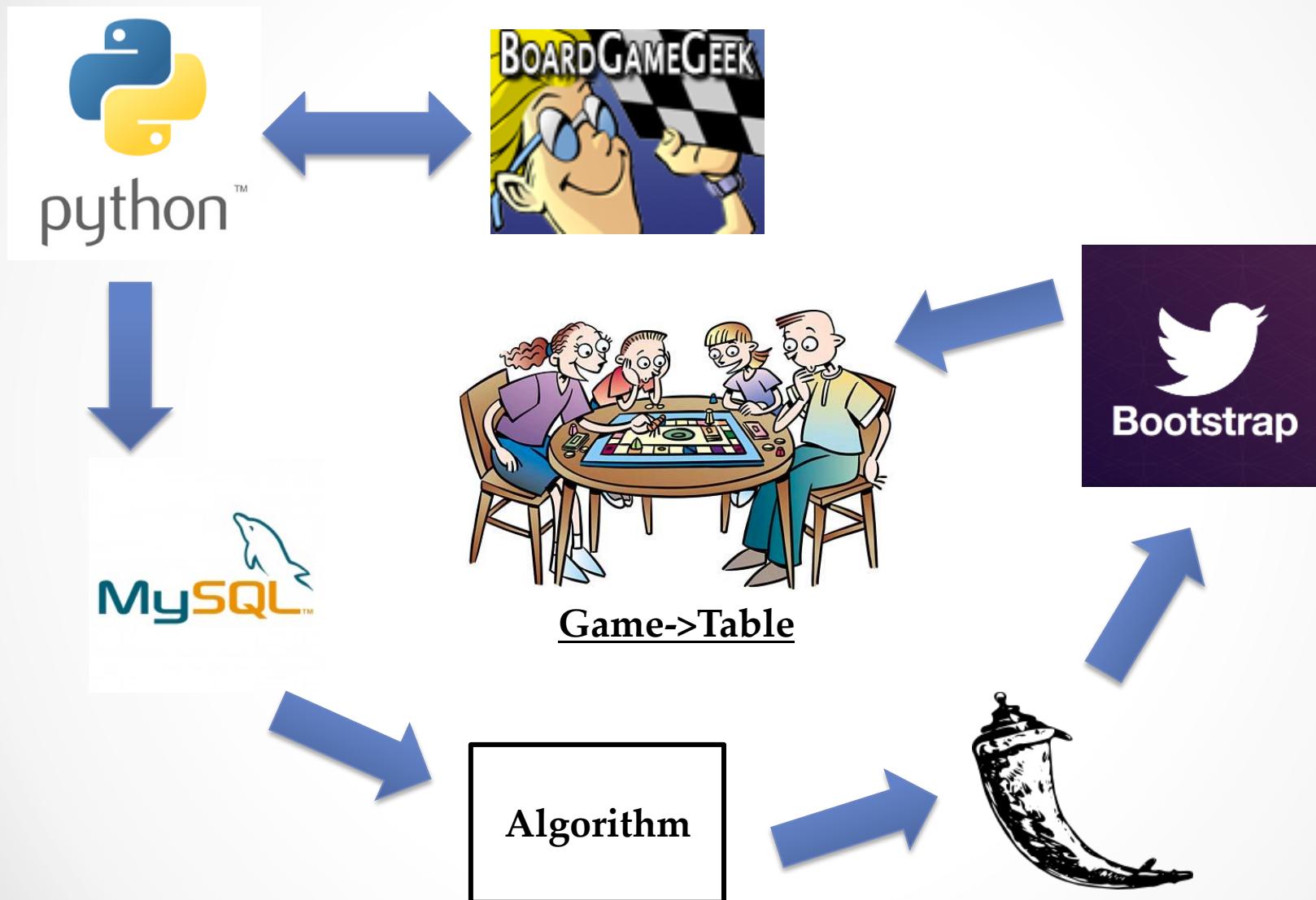
Hot | Recent Pg. 1 ▾

- / Faces Behind the Games - The Geek Weekly 1
- News Spiel 2015 Preview: Karuba, or Temple 0
- News Knizia's Medici Returns in a New Edition 54
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Board Game | Designer | Publisher  
Gallery: Game ▾ Hot | Recent Pg. 1 ▾

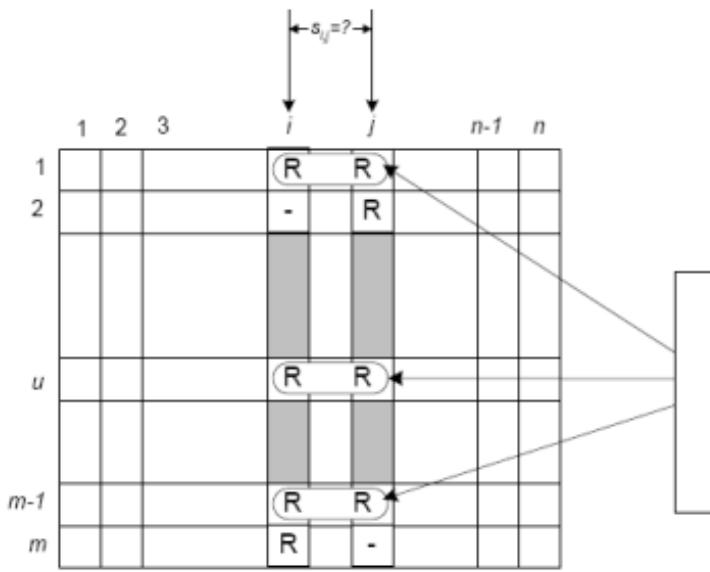
Images [Browse ▾]  
Gallery: Game ▾

# Data Pipeline

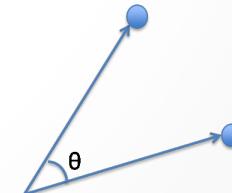


# Algorithm

- **Item-based collaborative filtering** using adjusted-cosine similarity of an individual or group's boardgame ratings and their purchase history
- Training Set
  - 11,000+ boardgames
  - 50,000+ users (Users who have rated 20+ games)
- User-Rating Matrix Sparsity = 97.5% zeros
- Predictions computed using a weighted sum

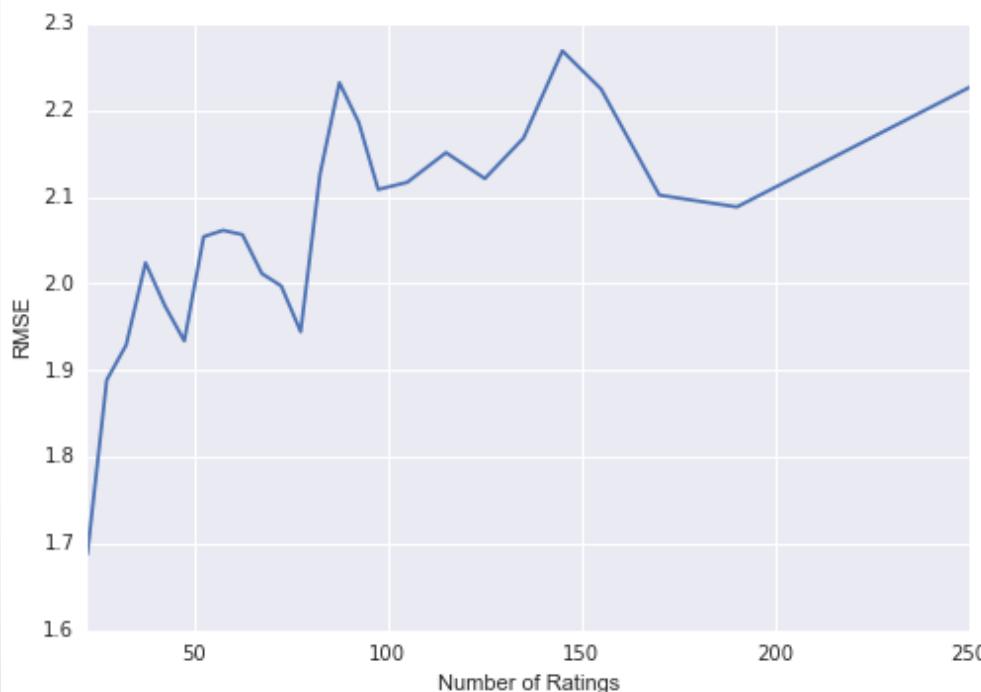


$$sim(A, B) = \cos(\theta) = \frac{A \cdot B}{\|A\| \|B\|}$$



# Validation

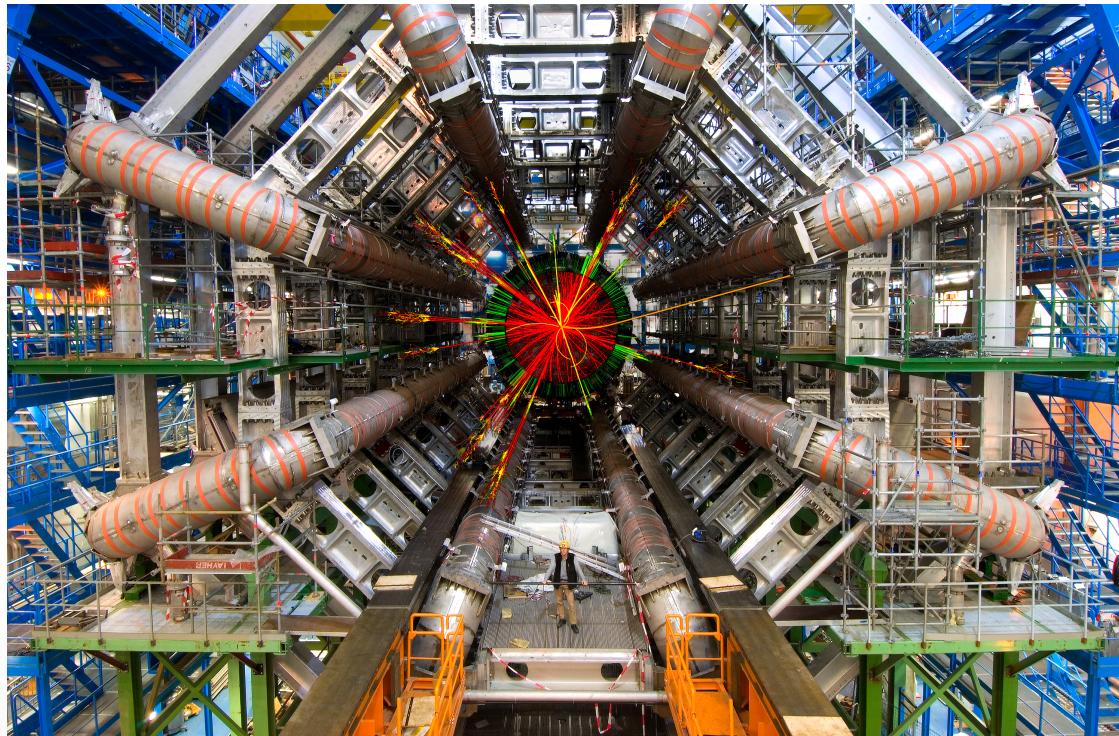
- Created a test set with 10% of the data
- The Root-Mean-Square Error (RMSE) were calculated using a **leave-one-out technique** for all ratings in the test set
- Average difference between algorithm prediction and user rating was **1.33 points** (scale 1-10)



**User Preferences/Bias  
change over time**

# About Me

- More for this slide next time...but particles!



# Back up

$$sim(i, j) = \frac{\sum_{u \in U} (R_{u,i} - \bar{R}_u)(R_{u,j} - \bar{R}_u)}{\sqrt{\sum_{u \in U} (R_{u,i} - \bar{R}_u)^2} \sqrt{\sum_{u \in U} (R_{u,j} - \bar{R}_u)^2}}.$$

$$P_{u,i} = \frac{\sum_{\text{all similar items, } N} (s_{i,N} * R_{u,N})}{\sum_{\text{all similar items, } N} (|s_{i,N}|)}$$