

# Preliminary Analysis of Steam Gaming Data

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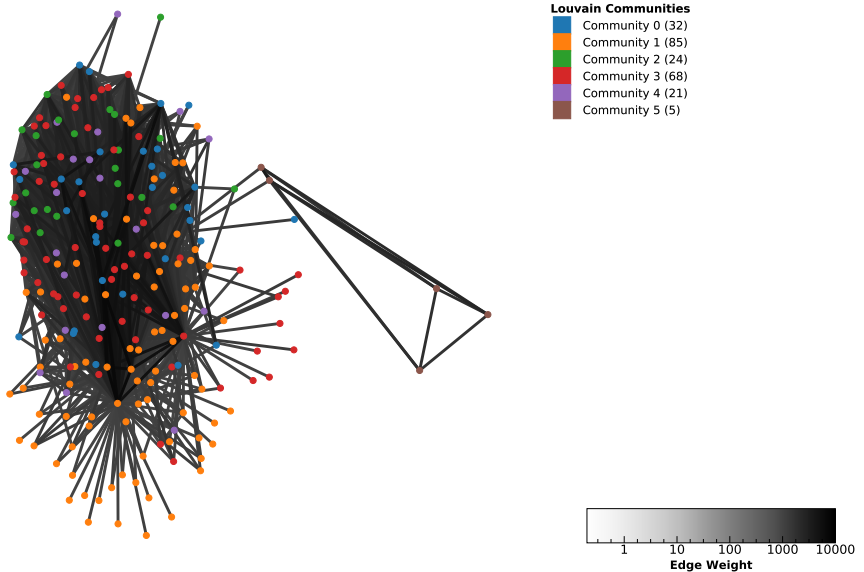
May 23th, 2019

# Introduction

- Steam is a popular video game distribution platform
- A 150 GB [dataset](#) is available from the API as a SQL dump
- Extract the top 5 games per user, with  $> 2$  hours played
- Make an undirected graph in Python + NetworkX with:
  - Nodes  $\leftrightarrow$  Game titles
  - Edges  $\leftrightarrow$  Two games appeared together in an user's library
- Find communities within the graph via the [Louvain method](#) with [python-louvain](#)

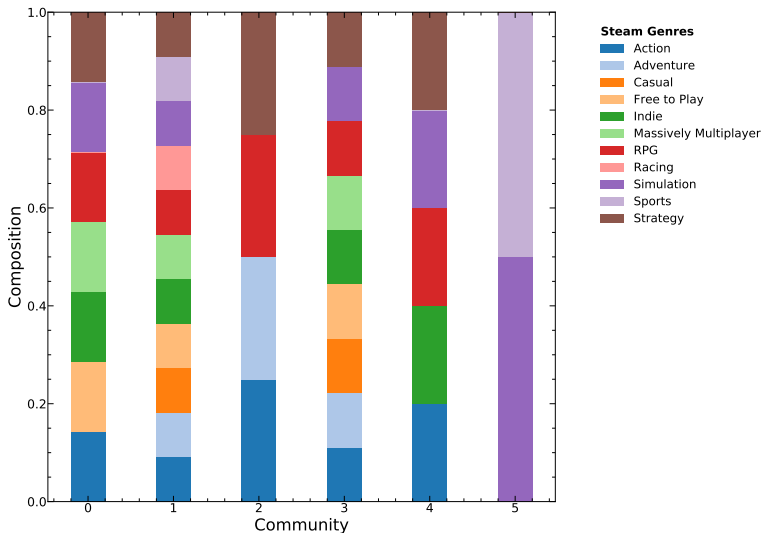


# Game Graph



(Kamada-Kawai force-directed layout)

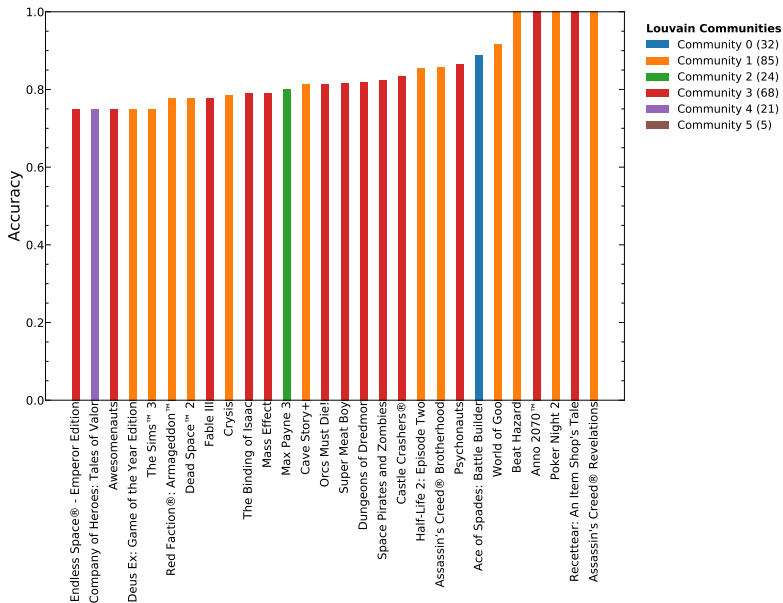
# Community Genre Composition



# Game Recommendations

- First approach, for each game predict the top 5 similar games based on the largest edge weight
  - Similar in concept to a  $k$ -nearest neighbor recommender
- Sample 1000 random users, see if we predicted  $\geq 3$  games they own
- On this metric,  $\approx 25\%$  of the considered games generate predictions with  $> 75\%$  accuracy
  - For more results see backup

# Prediction Accuracy



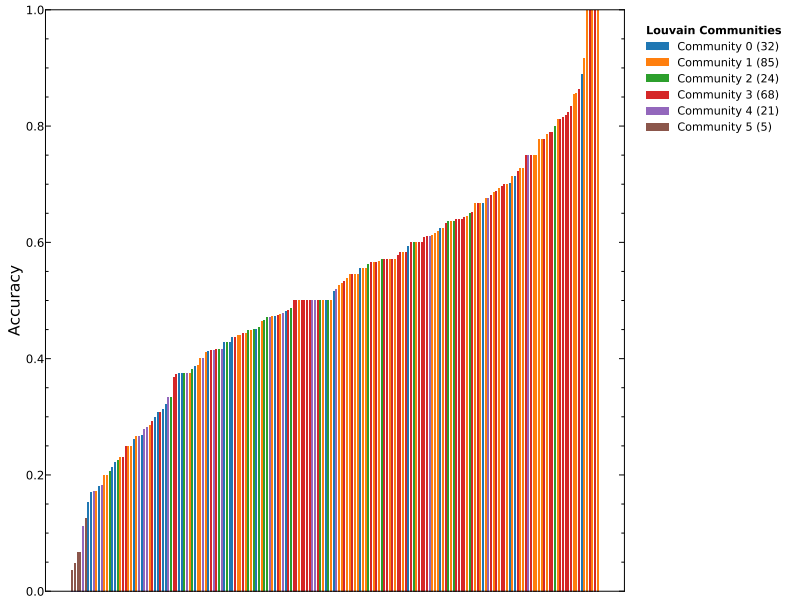
# Possible Future Directions

- Try other recommendation systems such as those described in [arXiv:1808.00004](#) or [arXiv:1604.03147](#)
- Investigate friend list data

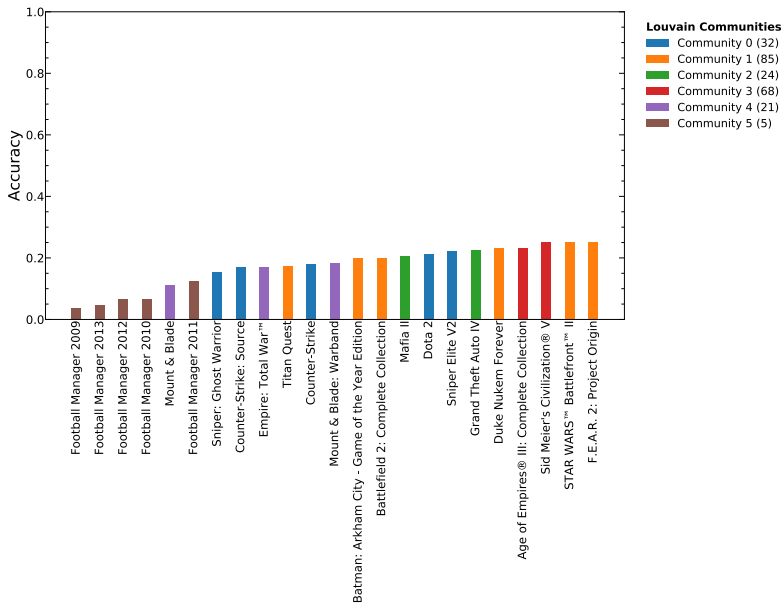
# Backup



# Prediction Accuracy (All)



# Prediction Accuracy (Low)



# Community Members: 0

Ace of Spades: Battle Builder  
Aliens vs. Predator  
Arma 2  
Arma 2: Operation Arrowhead  
Arma 3  
BRINK  
Call of Duty: Black Ops II — Zombies  
Call of Duty 4: Modern Warfare  
Call of Duty: Black Ops  
Call of Duty: Black Ops II  
Call of Duty: Modern Warfare 2  
Call of Duty: Modern Warfare 3  
Chivalry: Medieval Warfare  
Counter—Strike  
Counter—Strike: Condition Zero  
Counter—Strike: Global Offensive  
Counter—Strike: Source  
Day of Defeat  
Day of Defeat: Source  
Dota 2  
Dota 2 Test  
Garry's Mod  
Half—Life 2: Deathmatch  
Half—Life 2: Lost Coast  
Homefront  
Infestation: Survivor Stories Classic  
Killing Floor  
Natural Selection 2  
PAYDAY The Heist  
Red Orchestra 2: Heroes of Stalingrad with Rising Storm  
Sniper Elite V2  
Sniper: Ghost Warrior

# Community Members: 1

Age of Empires II HD  
Amnesia: The Dark Descent  
Antichamber  
Assassin's Creed 2 Deluxe  
Assassin's Creed Revelations  
Assassin's Creed: Director's Cut'  
Assassins Creed Brotherhood'  
Assassins Creed III  
Atom Zombie Smasher  
AudioSurf  
Batman: Arkham City — GOTY  
Battlefield 2: Complete Collection  
Beat Hazard  
BioShock 2  
Burnout Paradise: The Ultimate Box  
Call of Duty: World at War  
Cave Story+  
Command & Conquer: Red Alert 3  
Crysis  
Crysis 2 Maximum  
Crysis Warhead  
Dead Rising 2  
Dead Space  
Dead Space 2  
Deus Ex: GOTY  
DiRT 2  
DiRT 3  
Duke Nukem Forever

F.E.A.R.  
F.E.A.R. 2: Project Origin  
F.E.A.R. 3  
Fallout 3  
From Dust  
Frozen Synapse  
GRID  
Global Agenda  
Grand Theft Auto: San Andreas  
Half-Life  
Half-Life 2  
Half-Life 2: Episode One  
Half-Life 2: Episode Two  
Half-Life: Blue Shift  
Half-Life: Opposing Force  
Half-Life: Source  
Hitman: Blood Money  
Kerbal Space Program  
Left 4 Dead  
Left 4 Dead 2  
Little Inferno  
Machinarium  
Mirror's Edge  
Monday Night Combat  
Need For Speed: Hot Pursuit  
Poker Night 2  
Poker Night at the Inventory  
Portal  
Portal 2

Prototype  
Red Faction Guerrilla  
Red Faction: Armageddon  
Resident Evil 5/ Biohazard 5  
S.T.A.L.K.E.R.: Call of Pripjat  
S.T.A.L.K.E.R.: Shadow of Chernobyl  
STAR WARS Battlefront II  
Saints Row 2  
Scribblenauts Unlimited  
Section 8: Prejudice  
Serious Sam 3: BFE  
Serious Sam HD: The First Encounter  
Serious Sam HD: The Second Encounter  
Sid Meier's Civilization IV  
SimCity 4 Deluxe  
Sonic Generations  
Spec Ops: The Line  
Team Fortress 2  
The Darkness II  
The Secret of Monkey Island: SE  
The Sims 3  
Titan Quest  
Tom Clancy's Rainbow Six Vegas 2  
Tom Clancy's Splinter Cell: Conviction  
Unreal Tournament 3 Black  
VVVVV  
World of Goo  
Worms Reloaded

# Community Members: 2

Alan Wake  
Batman: Arkham City  
Battlefield: Bad Company 2  
BioShock Infinite  
Dead Island Riptide  
Dead Island: GOTY  
Dishonored  
Far Cry 3  
Far Cry 2: Fortune's Edition  
Grand Theft Auto IV  
Grand Theft Auto: Episodes from Liberty City  
Hitman: Absolution  
Just Cause 2  
L.A. Noire  
Mafia II  
Max Payne 3  
Metro 2033  
Metro: Last Light  
RAGE  
Saints Row: The Third  
Sleeping Dogs  
The Walking Dead  
The Witcher 2: Assassins of Kings Enhanced Edition  
Tomb Raider

# Community Members: 3

Age of Empires III: Complete Collection	Dungeon Siege III	Psychonauts
Anno 2070	Dungeons of Dredmor	RIFT
Awesomenauts	Endless Space — Emperor Edition	Recettear: An Item Shop's Tale
Bastion	FTL: Faster Than Light	Risen 2: Dark Waters
Batman: Arkham Asylum GOTY	Fable III	STAR WARS — Knights of the Old Republic
BioShock	Fallout 3: GOTY	Sanctum
Borderlands	Fallout: New Vegas	Sid Meier's Civilization V
Borderlands 2	Hotline Miami	Space Pirates and Zombies
Braid	Kingdoms of Amalur: Reckoning	Stronghold 3 Gold
Castle Crashers	LIMBO	Super Meat Boy
Civilization IV: Beyond the Sword	Legend of Grimrock	Terraria
DARK SOULS: Prepare To Die	Lord of the Rings: War in the North	The Binding of Isaac
Darksiders II	Magic: The Gathering ... 2012	The Elder Scrolls III: Morrowind GOTY
Darksiders	Magic: The Gathering ... 2013	The Elder Scrolls IV: Oblivion GOTY
Defense Grid: The Awakening	Magicka	The Elder Scrolls V: Skyrim
Deus Ex: Human Revolution	Mark of the Ninja	The Witcher: Enhanced Director's Cut
Deus Ex: Human Revolution—Missing Link	Mass Effect	Titan Quest — Immortal Throne
Don't Starve	Mass Effect 2	Torchlight
Dragon Age II	Might & Magic: Heroes VI	Torchlight II
Dragon Age: Origins	Neverwinter Nights 2: Platinum	Trine 2: Complete Story
Dragon Age: Origins — Ultimate Edition	Orcs Must Die!	Trine Enchanted Edition
Dungeon Defenders	Orcs Must Die! 2	Tropico 4: Steam SE
	Plants vs. Zombies GOTY	XCOM: Enemy Unknown

# Community Members: 4

Company of Heroes  
Company of Heroes: Opposing Fronts  
Company of Heroes: Tales of Valor  
Crusader Kings II  
Empire: Total War  
Medieval II: Total War  
Mount & Blade  
Mount & Blade: Warband  
Mount & Blade: With Fire & Sword  
Napoleon: Total War  
R.U.S.E.  
Rome: Total War — Collection  
Sins of a Solar Empire: Rebellion  
Supreme Commander 2  
Total War: SHOGUN 2  
Wargame: European Escalation  
Warhammer 40,000: Dawn of War II: Retribution  
Warhammer 40,000: Space Marine  
Warhammer 40,000: Dawn of War — Soulstorm  
Warhammer 40,000: Dawn of War II Chaos Rising  
Warhammer 40,000: Dawn of War II

# Community Members: 5

Football Manager 2009  
Football Manager 2010  
Football Manager 2011  
Football Manager 2012  
Football Manager 2013