League of Legends Overlay Assistant

Midterm Report

Xihao Zhou
Bo Yang
Hao Yang
Ziheng Gong

USC Viterbi
School of Engineering

University of Southern California

Function Design

- **Champion Ban/Pick Tool**

- **In Game Item Build Tool**

Report catalog

- **Data crawling**

- **Model introduction & Demo**

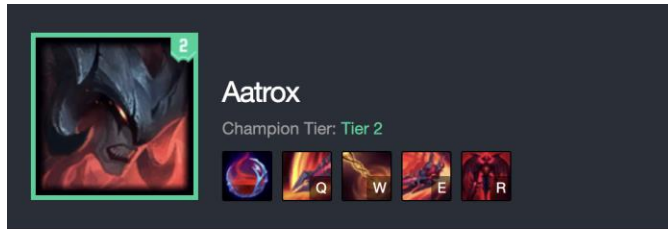- **Future steps**

Data Crawling

- **Champions Specific Build Sequence**

- **Top Players Specific Build Sequence**

Champions Specific Build Sequence

- **Total 143 Champions**

    - **Divided into Top, Mid, Bottom, Jungle, Support, 5 groups**

Champions Specific Build Sequence

Champion	1st Item	2nd Item	3rd Item	4th Item	Pick Rate	Win Rate
Aatrox	Black Cleaver	Death's Dance	Sterak's Gage		32.60%	62.96%
Aatrox	Black Cleaver	Death's Dance	Guardian Angel		15.90%	58.23%
Aatrox	Black Cleaver	Death's Dance	Spirit Visage		9.05%	60.00%
Aatrox	Black Cleaver	Death's Dance	Maw of Malmortius		3.62%	44.44%
Aatrox	Youmuu's Ghostblade	Black Cleaver	Death's Dance		3.42%	70.59%
Aatrox	Youmuu's Ghostblade	Black Cleaver	Sterak's Gage		3.22%	43.75%
Aatrox	Black Cleaver	Youmuu's Ghostblade	Sterak's Gage		2.62%	61.54%
Aatrox	Death's Dance	Black Cleaver	Sterak's Gage		2.21%	63.64%
Ahri	Hextech GLP-800	Twin Shadows	Morellonomicon		28.22%	60.19%
Ahri	Hextech GLP-800	Twin Shadows	Zhonya's Hourglass		17.35%	56.54%
Ahri	Luden's Echo	Morellonomicon	Zhonya's Hourglass		6.36%	55.24%
Ahri	Hextech GLP-800	Twin Shadows	Mejai's Soulstealer		4.45%	82.31%
Ahri	Luden's Echo	Morellonomicon	Rabadon's Deathcap		3.45%	60.53%
Ahri	Hextech GLP-800	Twin Shadows	Rabadon's Deathcap		3.12%	63.11%
Ahri	Hextech GLP-800	Twin Shadows	Banshee's Veil		2.72%	55.56%
Ahri	Luden's Echo	Zhonya's Hourglass	Morellonomicon		2.57%	49.41%
Akali	Hextech Gunblade	Morellonomicon	Zhonya's Hourglass		44.03%	55.87%
Akali	Hextech Gunblade	Zhonya's Hourglass	Morellonomicon		25.34%	53.40%
Akali	Hextech Gunblade	Morellonomicon	Rabadon's Deathcap		6.40%	59.62%
Akali	Hextech Gunblade	Zhonya's Hourglass	Rabadon's Deathcap		4.06%	54.55%
Akali	Hextech Gunblade	Morellonomicon	Void Staff		2.46%	35.00%
Akali	Hextech Gunblade	Zhonya's Hourglass	Void Staff		2.21%	44.44%
Akali	Hextech Gunblade	Rabadon's Deathcap	Zhonya's Hourglass		1.48%	58.33%
Akali	Hextech Gunblade	Zhonya's Hourglass	Banshee's Veil		1.48%	50.00%
Anivia	Rod of Ages	Archangel's Staff	Zhonya's Hourglass		29.23%	54.45%
Anivia	Rod of Ages	Archangel's Staff	Morellonomicon		14.00%	55.74%
Anivia	Rod of Ages	Archangel's Staff	Liandry's Torment		6.81%	61.80%

Top Players Specific Build Sequence

Ranked Solo

4 hours ago

Aatrox Level 15 Victory 25m 54s

6 / 3 / 8   4.67:1 KDA   163 (6.3) CS   P/Kill 58%   Tier Average Diamond 2   Triple Kill

Control Ward 1

	Second Th...	WO1VIL
	난 상관 안 해	초로콩
	QydQyd	Pick Dian...
	양뱡양이	제발부탁할게
	엉부엉이	용 슈

		Overview	Team Analysis	Builds	etc

Victory (Blue Team)

		Tier	OP Score	KDA	Damage	Wards	CS	Item
	Second Th...	Diamond 2	7 (4th)	2.17:1 9/6/4 (54%)	18,827	2 10 / 3	165 6.4/m	
	난 상관 안 해	Diamond 2	6.9 (5th)	15.00:1 2/1/13 (63%)	10,595	1 1 / 5	184 7.1/m	
	QydQyd	Diamond 2	7.3 (3rd)	4.67:1 6/3/8 (58%)	16,519	1 7 / 2	163 6.3/m	
	양뱡양이	Diamond 3	7.4 (2nd)	5.50:1 4/2/7 (46%)	9,371	2 8 / 4	202 7.8/m	
	엉부엉이	Level 208	7.9 (MVP)	18.00:1 3/1/15 (75%)	3,505	8 21 / 6	8 0.3/m	

1 4 6   Total Kill 24   13   0 0 2
Total Gold 50089   41733

Defeat (Red Team)

		Tier	OP Score	KDA	Damage	Wards	CS	Item
	WO1VIL	Diamond 3	6.3 (7th)	2.50:1 3/4/7 (77%)	19,785	1 8 / 1	179 6.9/m	
	초로콩	Diamond 2	6.7 (ACE)	1.60:1 7/5/1 (62%)	13,923	3 4 / 7	172 6.6/m	
	Pick Diana ...	Diamond 2	4.9 (8th)	0.50:1 3/6/0 (23%)	9,831	4 11 / 1	136 5.3/m	
	제발부탁할게	Diamond 2	4.3 (10th)	1.00:1 0/1/1 (8%)	10,640	0 8 / 1	185 7.1/m	
	용 슈	Diamond 1	4.7 (9th)	0.50:1 0/8/4 (31%)	5,858	6 24 / 6	23 0.9/m	

Ranked Solo

6 hours ago

Sylas Level 17 Victory 31m 38s

9 / 5 / 16   5.00:1 KDA   164 (5.2) CS   P/Kill 74%   Tier Average Diamond 2

Control Ward 3

	SungMinKR	마스터까지...
	못해도합방	GiveUpDr...
	알미운 해...	QydQyd
	BabyAlly	너얼드
	DRX HwX	Lu 혁뻠 민수

Ranked Solo

10 hours ago

Irelia Level 15 Victory 26m 48s

3 / 2 / 7   5.00:1 KDA   190 (7.1) CS   P/Kill 40%   Tier Average Diamond 2

Control Ward 3

	top is bus	SKT T1 J...
	ChanWu	8acemaker
	IIIIIIIIIII	QydQyd
	여자와 하...	조 들 호
	바텀기도메타	ZONNE

Ranked Solo

11 hours ago

Aatrox Level 16 Victory 23m 8s

15 / 1 / 4   19.00:1 KDA   209 (9) CS   P/Kill 76%   Tier Average Diamond 2   Double Kill MVP

Control Ward 2

	상관없음으...	기모돌
	플래네번가...	핑차단채팅...
	Saccharine	QydQyd
	1233475	creampie7
	wted	그랩장인 ...

Ranked Solo

a day ago

Sylas Level 15 Victory 25m 40s

6 / 5 / 12   3.60:1 KDA   164 (6.4) CS   P/Kill 55%   Tier Average Diamond 2

Control Ward 2

	밤혀도자라...	승리의여신...
	주꾸미는무...	yukariko
	다이에나로...	QydQyd
	주눅들지마라	Nxxy
	문 타릭	소수성

Page	Match	Game Result	Champion	My Item Build	Enemy Team Build
0	0	win	Ornn	["Doran's Shield", 'Infernal Mask', 'Ruby Crystal', 'Gargoyle Stoneplate', 'Ninja Tab	['Statikk Shiv', 'Refillable Potion', 'Trinity Force', '
0	0	win	Ornn	["Doran's Shield", 'Infernal Mask', 'Ruby Crystal', 'Gargoyle Stoneplate', 'Ninja Tab	[', 'Refillable Potion', 'Ninja Tabi', '', 'Black Cleave
0	0	win	Ornn	["Doran's Shield", 'Infernal Mask', 'Ruby Crystal', 'Gargoyle Stoneplate', 'Ninja Tab	['Hextech Gunblade', 'Morellonomicon', 'Stopwat
0	0	win	Ornn	["Doran's Shield", 'Infernal Mask', 'Ruby Crystal', 'Gargoyle Stoneplate', 'Ninja Tab	['Sorcerer's Shoes', "Luden's Echo", 'Banshee's
0	0	win	Ornn	["Doran's Shield", 'Infernal Mask', 'Ruby Crystal', 'Gargoyle Stoneplate', 'Ninja Tab	['Gargoyle Stoneplate', 'Glacial Shroud', 'Bulwark
0	1	win	Ornn	["Doran's Shield", 'Forgefire Cape', 'Infernal Mask', 'Boots of Speed', 'Chain Vest	["Youmuu's Ghostblade", 'Doran's Blade', 'Serra
0	1	win	Ornn	["Doran's Shield", 'Forgefire Cape', 'Infernal Mask', 'Boots of Speed', 'Chain Vest	[', 'Refillable Potion', "Sorcerer's Shoes", 'Amplif
0	1	win	Ornn	["Doran's Shield", 'Forgefire Cape', 'Infernal Mask', 'Boots of Speed', 'Chain Vest	['Ninja Tabi', 'Sunfire Cape', 'Refillable Potion', "W
0	1	win	Ornn	["Doran's Shield", 'Forgefire Cape', 'Infernal Mask', 'Boots of Speed', 'Chain Vest	['Boots of Swiftness', 'Stormrazor', "Doran's Blad
0	1	win	Ornn	["Doran's Shield", 'Forgefire Cape', 'Infernal Mask', 'Boots of Speed', 'Chain Vest	['Harrowing Crescent', 'Umbral Glaive', 'Ninja Tab
0	2	lose	Kassadin	["Seeker's Armguard", "Mercury's Treads", "Morellonomicon", "Seraph's Embrace	['Kindlegem', 'Broken Stopwatch', "Death's Danc
0	2	lose	Kassadin	["Seeker's Armguard", "Mercury's Treads", "Morellonomicon", "Seraph's Embrace	['Morellonomicon', 'Stopwatch', "Sorcerer's Shoe
0	2	lose	Kassadin	["Seeker's Armguard", "Mercury's Treads", "Morellonomicon", "Seraph's Embrace	['Spectre's Cowl', 'Null-Magic Mantle', 'Rejuvena
0	2	lose	Kassadin	["Seeker's Armguard", "Mercury's Treads", "Morellonomicon", "Seraph's Embrace	["Guinsoo's Rageblade', 'Infinity Edge', 'Stopwat
0	2	lose	Kassadin	["Seeker's Armguard", "Mercury's Treads", "Morellonomicon", "Seraph's Embrace	['Athene's Unholy Grail', 'Redemption', "Knight's
0	3	lose	Ornn	['Forgefire Cape', 'Frozen Fist', 'Cloth Armor', '', 'Doran's Shield', 'Ninja Tabi', ''	['Death's Dance', 'Black Cleaver', 'Stopwatch', '
0	3	lose	Ornn	['Forgefire Cape', 'Frozen Fist', 'Cloth Armor', '', 'Doran's Shield', 'Ninja Tabi', ''	[', 'Amplifying Tome', 'Twin Shadows', "Sorcerer'
0	3	lose	Ornn	['Forgefire Cape', 'Frozen Fist', 'Cloth Armor', '', 'Doran's Shield', 'Ninja Tabi', ''	[', '', "Doran's Shield", "Mercury's Treads", 'Black
0	3	lose	Ornn	['Forgefire Cape', 'Frozen Fist', 'Cloth Armor', '', 'Doran's Shield', 'Ninja Tabi', ''	['Dagger', 'Zeal', "Doran's Blade", "Berserker's G
0	3	lose	Ornn	['Forgefire Cape', 'Frozen Fist', 'Cloth Armor', '', 'Doran's Shield', 'Ninja Tabi', ''	['Gargoyle Stoneplate', 'Knight's Vow', 'Bulwark
0	4	win	Ornn	['Refillable Potion', "Doran's Shield", 'Abyssal Mask', 'Bami's Cinder', "Mercury's	["Doran's Shield", 'Refillable Potion', 'Ruby Cryst
0	4	win	Ornn	['Refillable Potion', "Doran's Shield", 'Abyssal Mask', 'Bami's Cinder', "Mercury's	['Refillable Potion', '', '', 'Dagger', "Berserker's Gr
0	4	win	Ornn	['Refillable Potion', "Doran's Shield", 'Abyssal Mask', 'Bami's Cinder', "Mercury's	['Bilgewater Cutlass', "Doran's Blade", "Executio
0	4	win	Ornn	['Refillable Potion', "Doran's Shield", 'Abyssal Mask', 'Bami's Cinder', "Mercury's	['Doran's Ring', 'Refillable Potion', 'Rod of Ages'
0	4	win	Ornn	['Refillable Potion', "Doran's Shield", 'Abyssal Mask', 'Bami's Cinder', "Mercury's	['Targon's Buckler', 'Cloth Armor', 'Stopwatch', '
0	5	win	Kayle	["Nashor's Tooth", '', 'Wit's End', "Hextech Gunblade", "Berserker's Greaves", "G	['Doran's Blade', 'Refillable Potion', 'Iceborn Gau
0	5	win	Kayle	["Nashor's Tooth", '', 'Wit's End', "Hextech Gunblade", "Berserker's Greaves", "G	['Trinity Force', 'Refillable Potion', 'Boots of Mobil
0	5	win	Kayle	["Nashor's Tooth", '', 'Wit's End', "Hextech Gunblade", "Berserker's Greaves", "G	['Edge of Night', "Youmuu's Ghostblade", 'Duskbl
0	5	win	Kayle	["Nashor's Tooth", '', 'Wit's End', "Hextech Gunblade", "Berserker's Greaves", "G	['Infinity Edge', "Runaan's Hurricane", 'Kircheis S
0	5	win	Kayle	["Nashor's Tooth", '', 'Wit's End', "Hextech Gunblade", "Berserker's Greaves", "G	['Shard of True Ice', 'Oblivion Orb', 'Blasting Wan

Top Players Specific Build Sequence

- We crawled 45 players each champion.

- About 300 matches each player.

- Total approximately 1900000 item build sequence
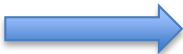
Model Design

Champion Ban/Pick Tool

- Collect match up win rate data and champion basic stats

- Generate similarity matrices (for both datasets)

- Find the most similar champions from the matrix (top20*5)

- Keep champions that belong to the assigned position

- Delete champions banned by ally team

- Show top3 suggestions (sorted by overall win rate)

Logic Design

Champion Ban/Pick Tool

- OCR, Pytesseract ⟶ Game Window Detection

- Capture pictures in the game window

- Detect champions, position info… shows in the pictures

- Use them as input, give pick suggestions

Demo

Champion Ban/Pick Tool

- https://youtu.be/f6-ZWi1BwG8

Future Steps

In-Game Item Build Tool

- Logic design (Finished)

- Image detection training (Finished)

- Backend model training (In Progress)

- Frontend adjustment (Haven't Start)

Rune Pick Tool (If we have time)

- This will be a tool that can automatically pick a set of runes for our user before they get into the game (based on enemy champions)

Thank You