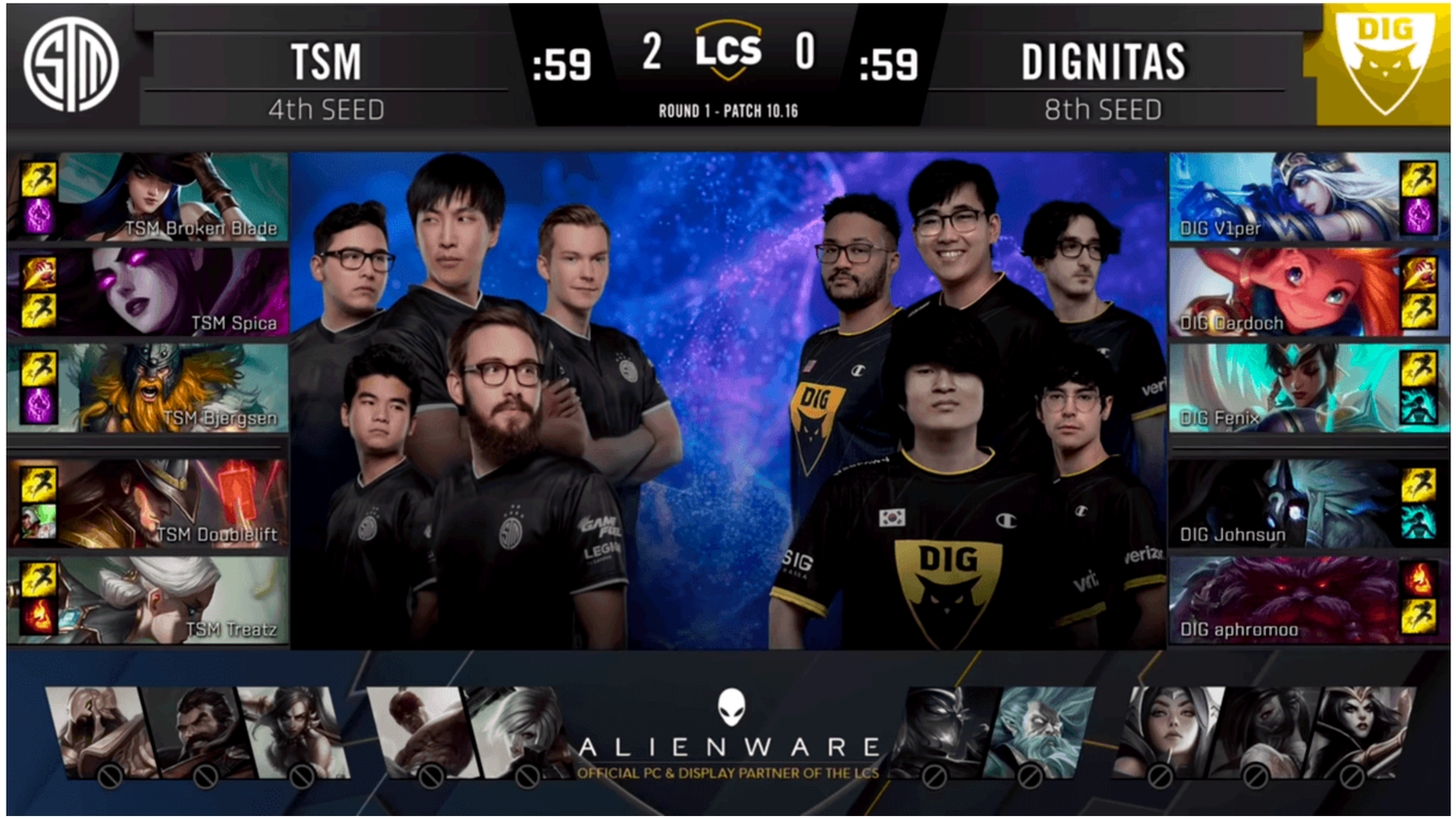
liam.gg

League of Legends (LoL) win interpreter web app

http://liamisaacs.com/league

10-Feb-2021 (Revised: 20-Mar-2021)

5v5, each player picks a “champion” (1 of ~150)



Online “ranked” system with **divisions** (IRON/SILVER) and **tiers** (IV, III, II, I)

division	IV	III	II	I
IRON	IRON IV	IRON III	IRON II	IRON I
SILVER	SILVER IV	SILVER III	SILVER II	SILVER I
GOLD	GOLD IV	GOLD III	GOLD II	GOLD I
PLATINUM	PLATINUM IV	PLATINUM III	PLATINUM II	PLATINUM I
DIAMOND	DIAMOND IV	DIAMOND III	DIAMOND II	DIAMOND I
MASTER	MASTER I	–	–	–
GRANDMASTER	GRANDMASTER I	–	–	–
CHALLENGER	CHALLENGER I	–	–	–

Roadmap

—

- Data collection using RiotWatcher Riot API
- Study design (filter for user rank, champion, role)
- Model interpretation using SHAP values
- WebApp hosted on AWS

Credit @schlieffenplan

Part I: The Data

100-200k games for each ranked division and tier

Collected using APIs

Assume divisions are “separable” - GOLD II is much different than IRON IV

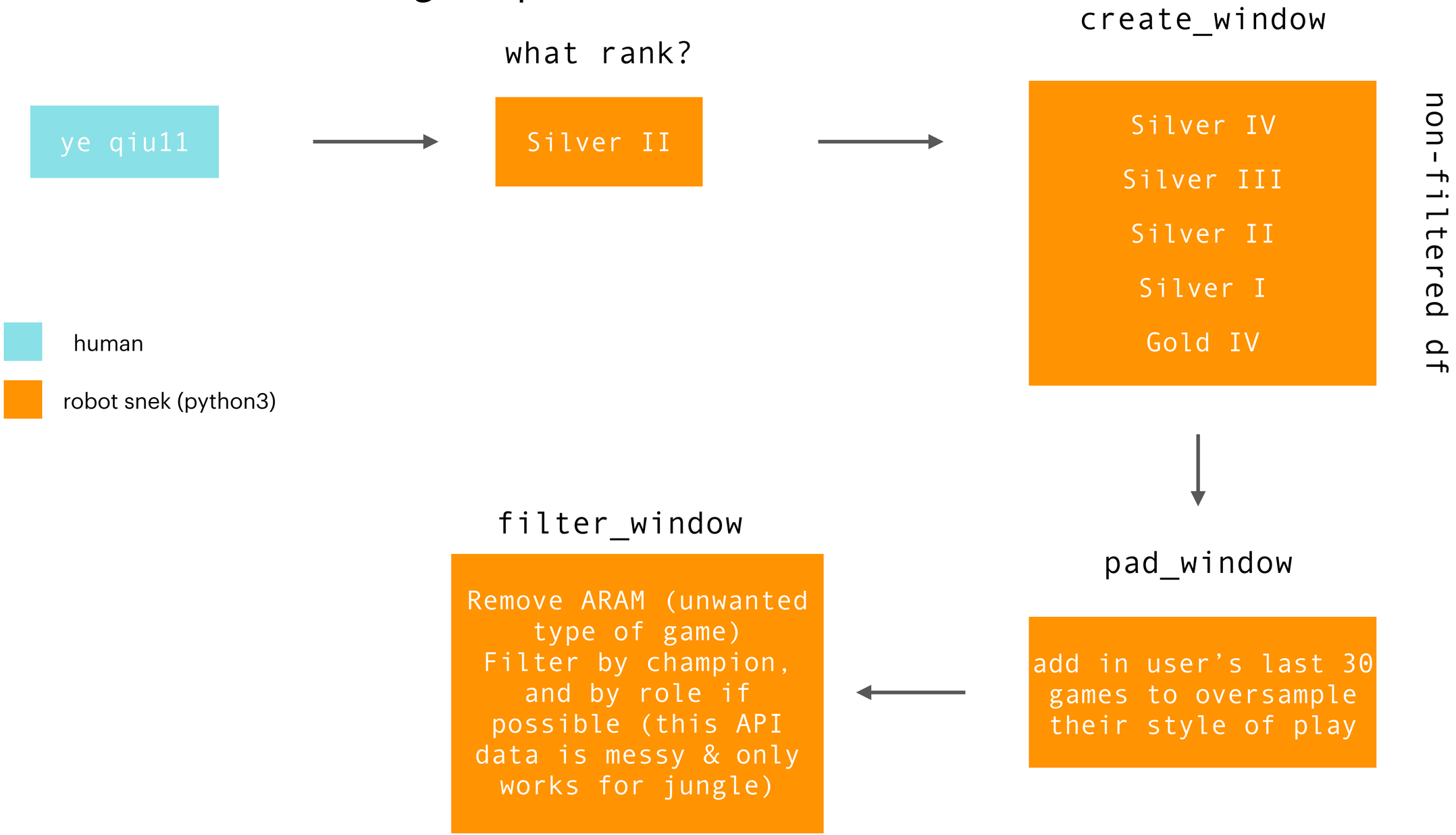
Assume game’s structure is largely the same as 1 mo. ago (1 patch behind)

Part II: Data Cleaning

League is a series of <u>decisions</u>

Jump straight to ensemble models (RF & XGBoost)

The Data Cleaning Pipeline



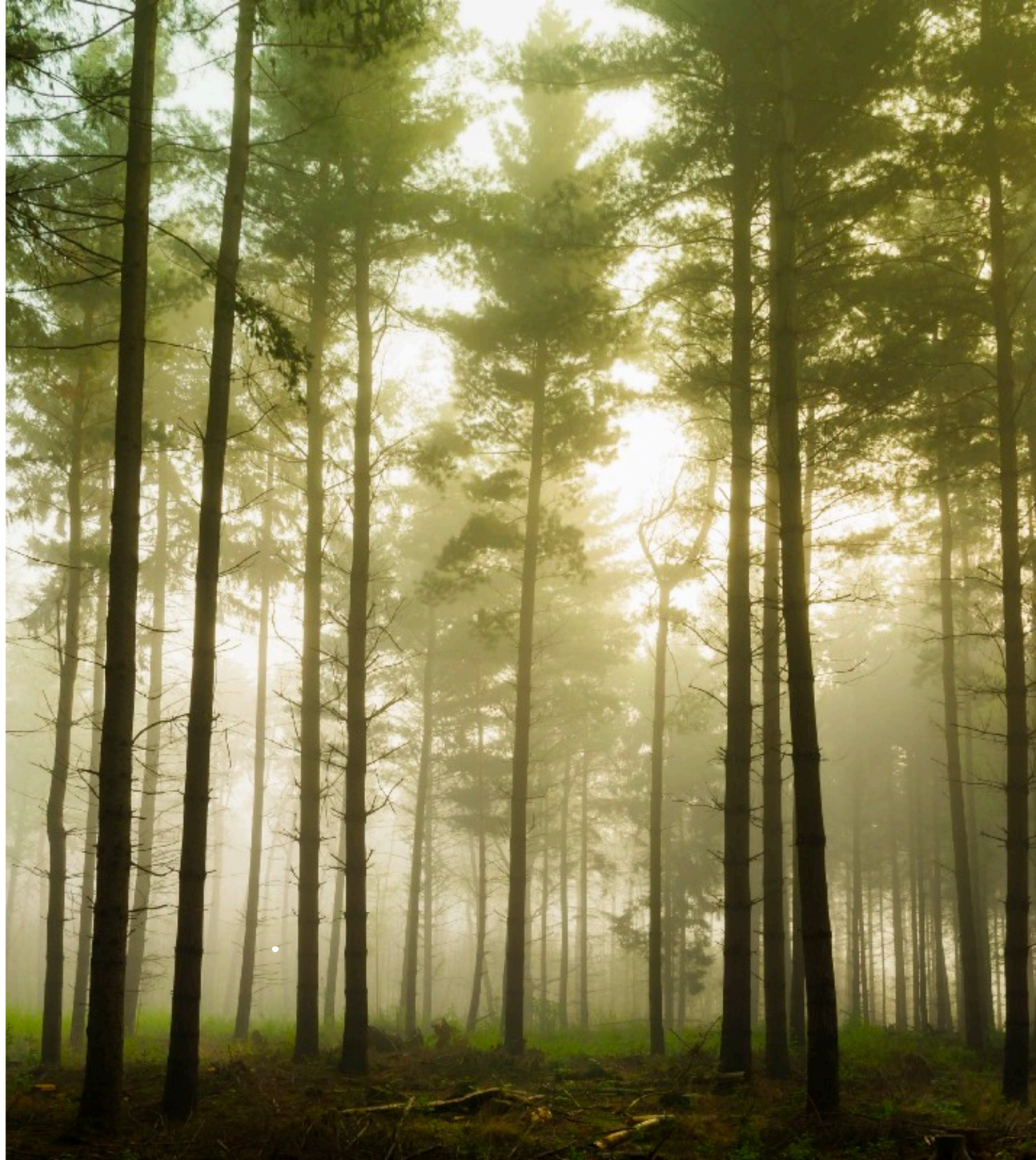
Part III: Choosing a model

Want interpretable results

*RF & XGBoost do **not** give interpretable results*

RandomForest

bagging & feature randomness



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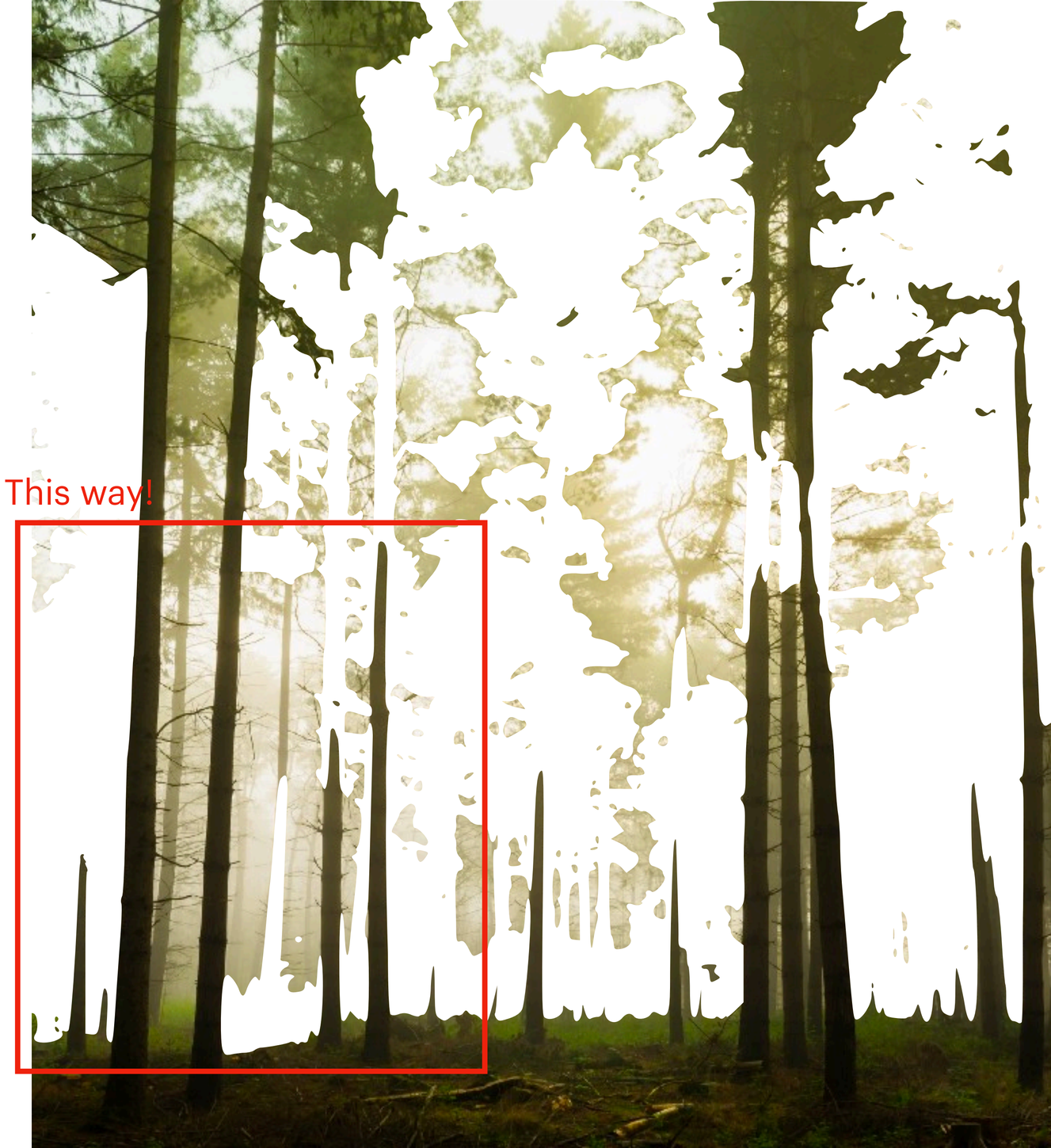


RandomForest

bagging & feature randomness

“Which they go thru that forest I have no idea my dear Frodo”

-Gandalf

The Data Modeling Pipeline

Cleaning process

ye qiu11

Cleaned data

generate_model

Convert to rates

Y = df['win']

Model = LogisticRegression()

Lib linear, max_iter=900, C=0.1

model's fit on X, y train-test-split

human

robot snek (python3)

Prepare SHAP plot

shap.Explainer()

shap_values

Just array for each data point

Render SHAP plot in HTML

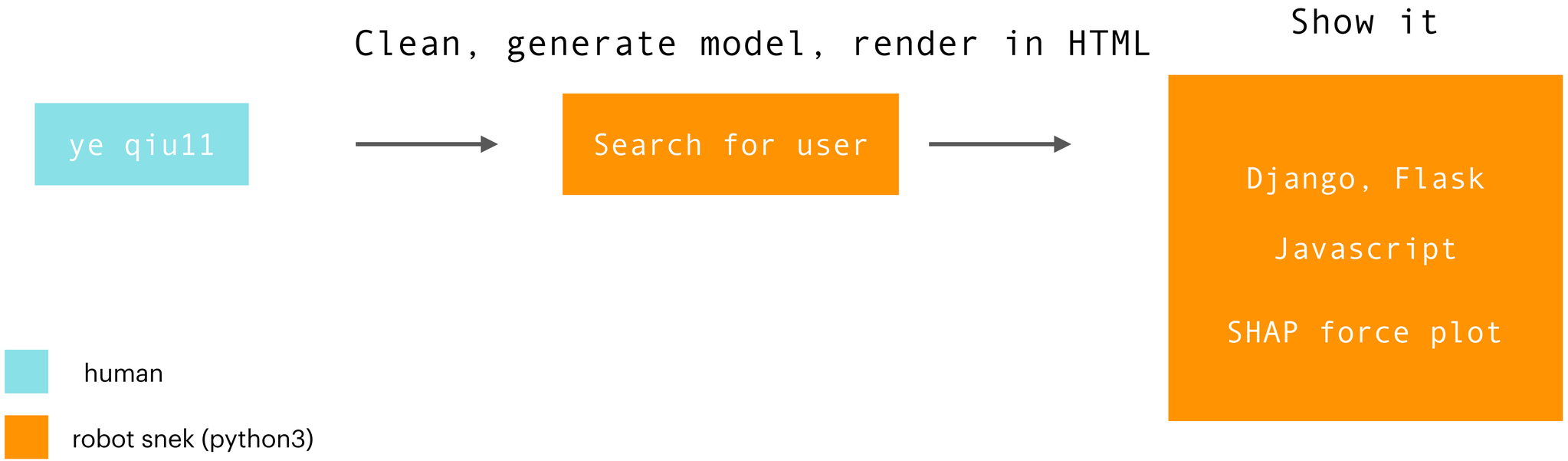
Use unique feature as "primary key" to communicate btwn HTML and model

```
force_plot = shap.plots.force(shap_values[ind],
             matplotlib=False)
shap_html = f"<head>{shap.getjs()}</head><body>
             {force_plot.html()}</body>"
```

Part IV: The WebApp

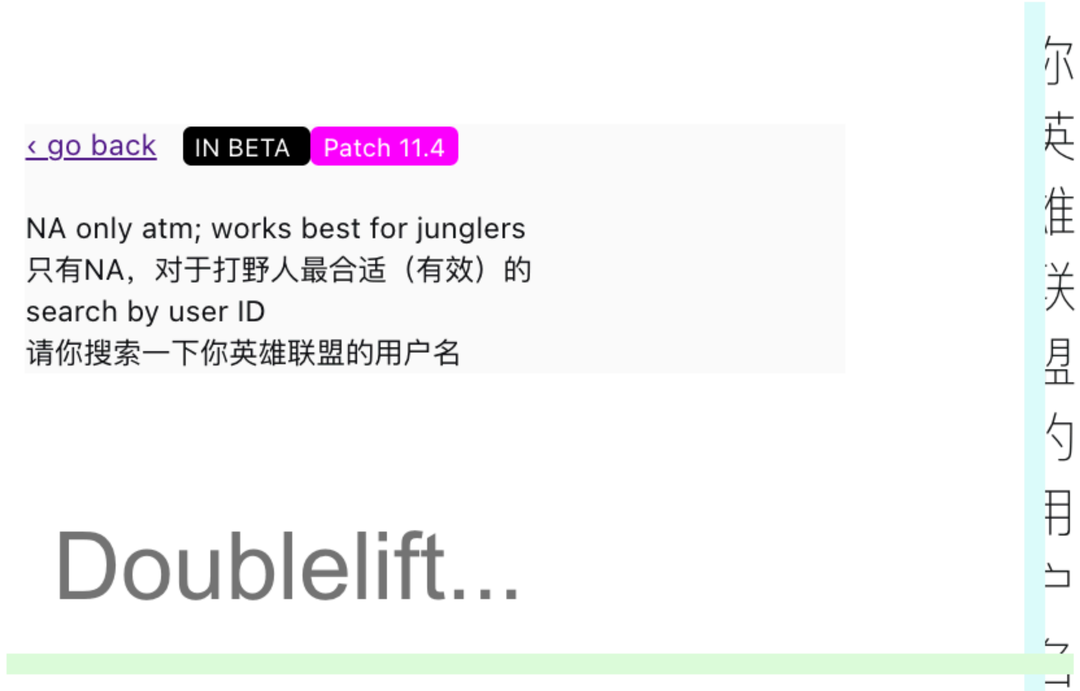
Want easy-to-see-what's-going-on results

The Human Experience Pipeline

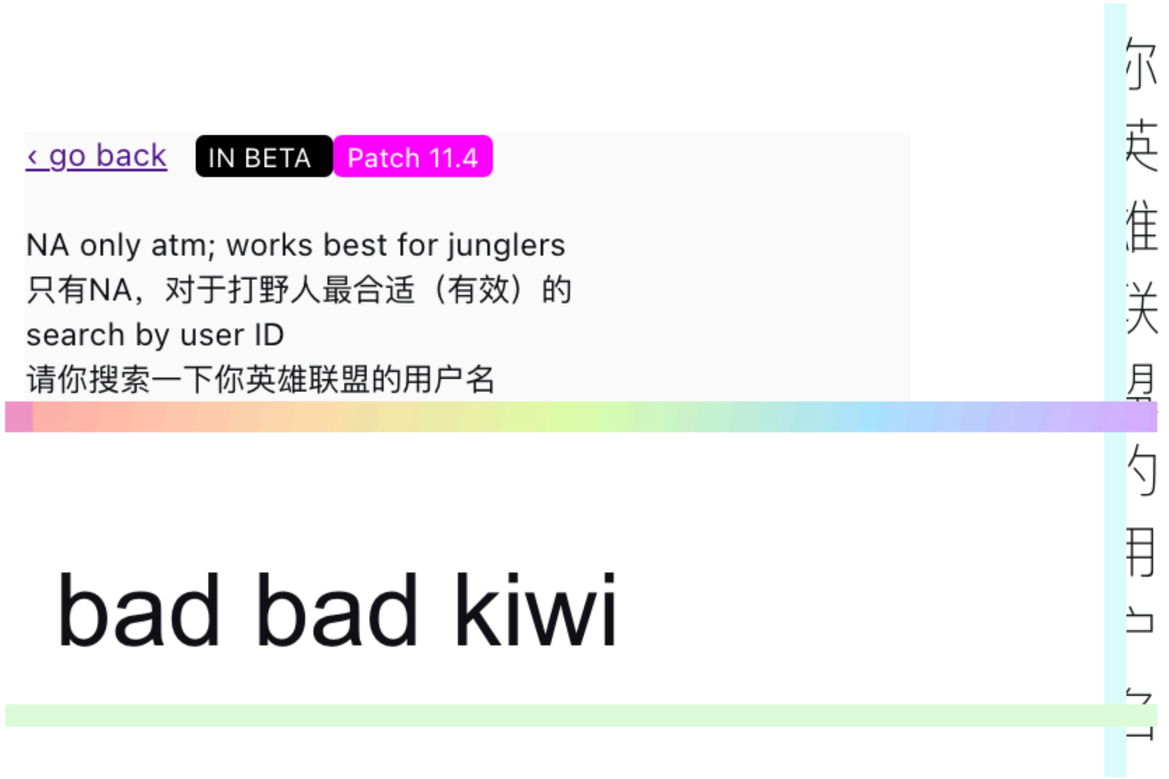


On my website, liamisaacs.com

Search page, http://liamisaacs.com/league



Loading animation…



Display user games

bad bad kiwi

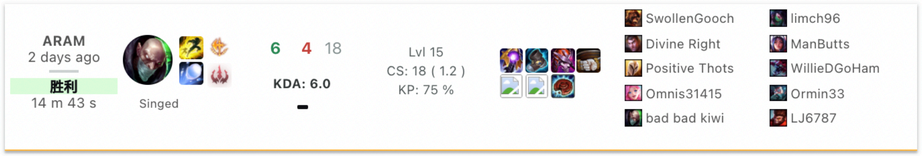
GOLD III

14 LP
52 W
49 L

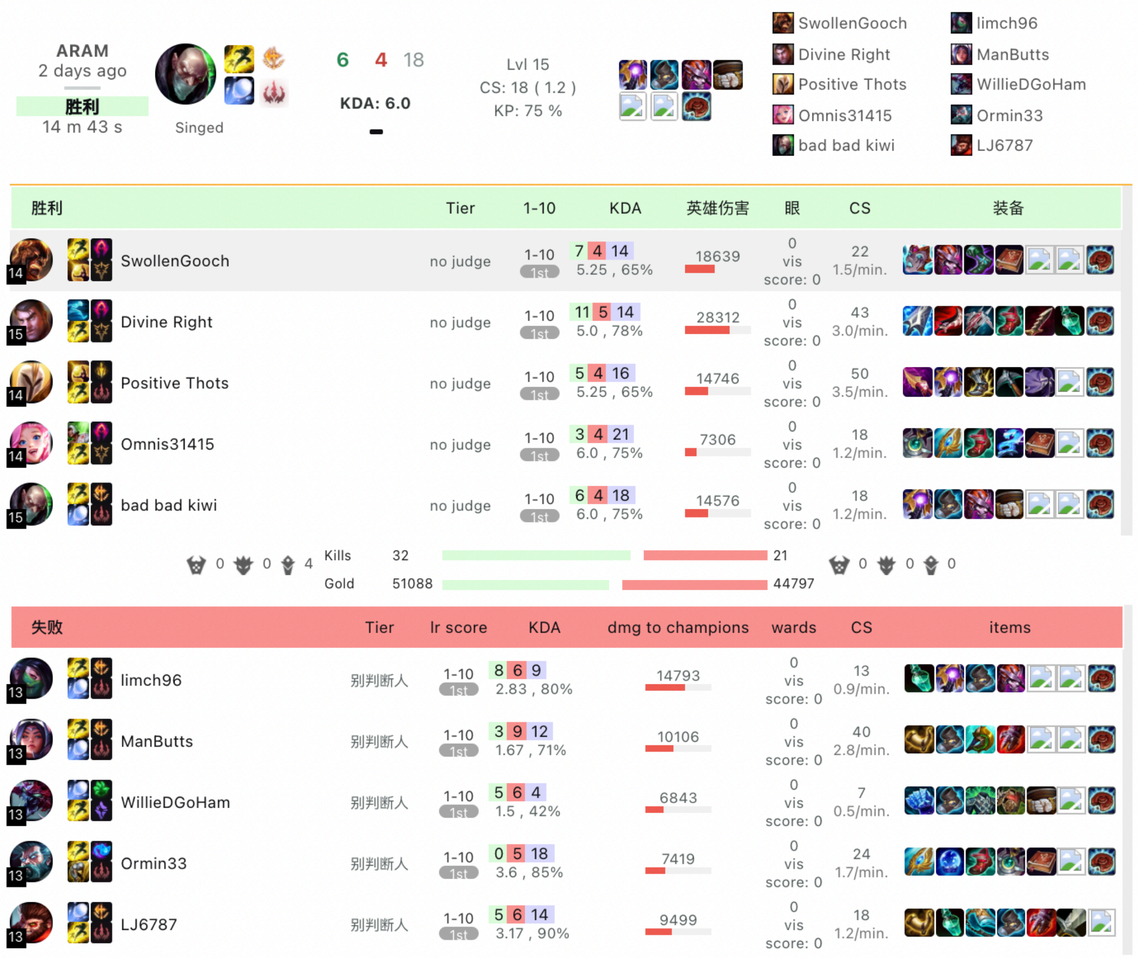
BOOST MY STATS

ARAM 2 days ago **胜利** 14 m 43 s	Singed	6 4 18 **KDA: 6.0**	Lvl 15 CS: 18 (1.2) KP: 75 %		SwollenGooch Divine Right Positive Thots Omnis31415 bad bad kiwi	limch96 ManButts WillieDGoHam Ormin33 LJ6787
ARAM 2 days ago **失败** 19 m 2 s	AurelionSol	9 7 19 **KDA: 4.0**	Lvl 17 CS: 71 (3.7) KP: 66 %		Ânathema SwollenGooch Divine Right Omnis31415 bad bad kiwi	ferda f ZettaVolt Glumbert eBully DrDurk

What happens if we click a game?



Display in-depth statistics



What does this do

bad bad kiwi

GOLD III

14 LP
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BOOST MY STATS

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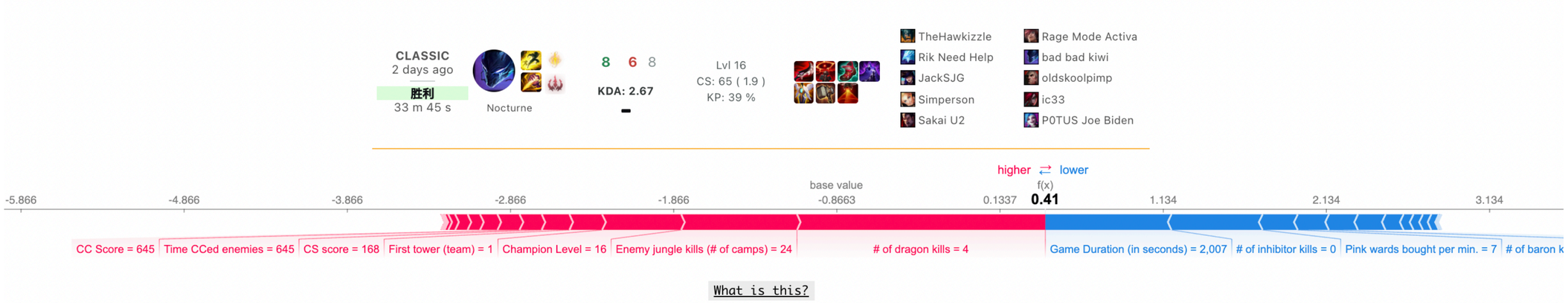
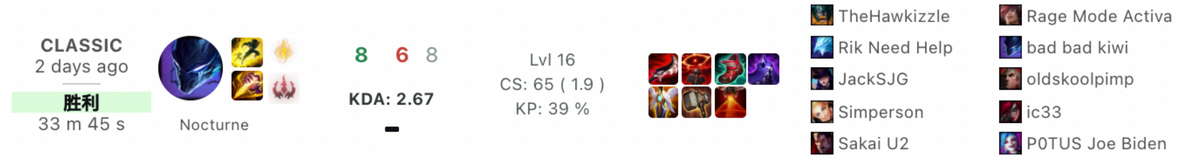
Displays SHAP plot below game



What is this?

Clicking gives in-depth statistics



What is this?

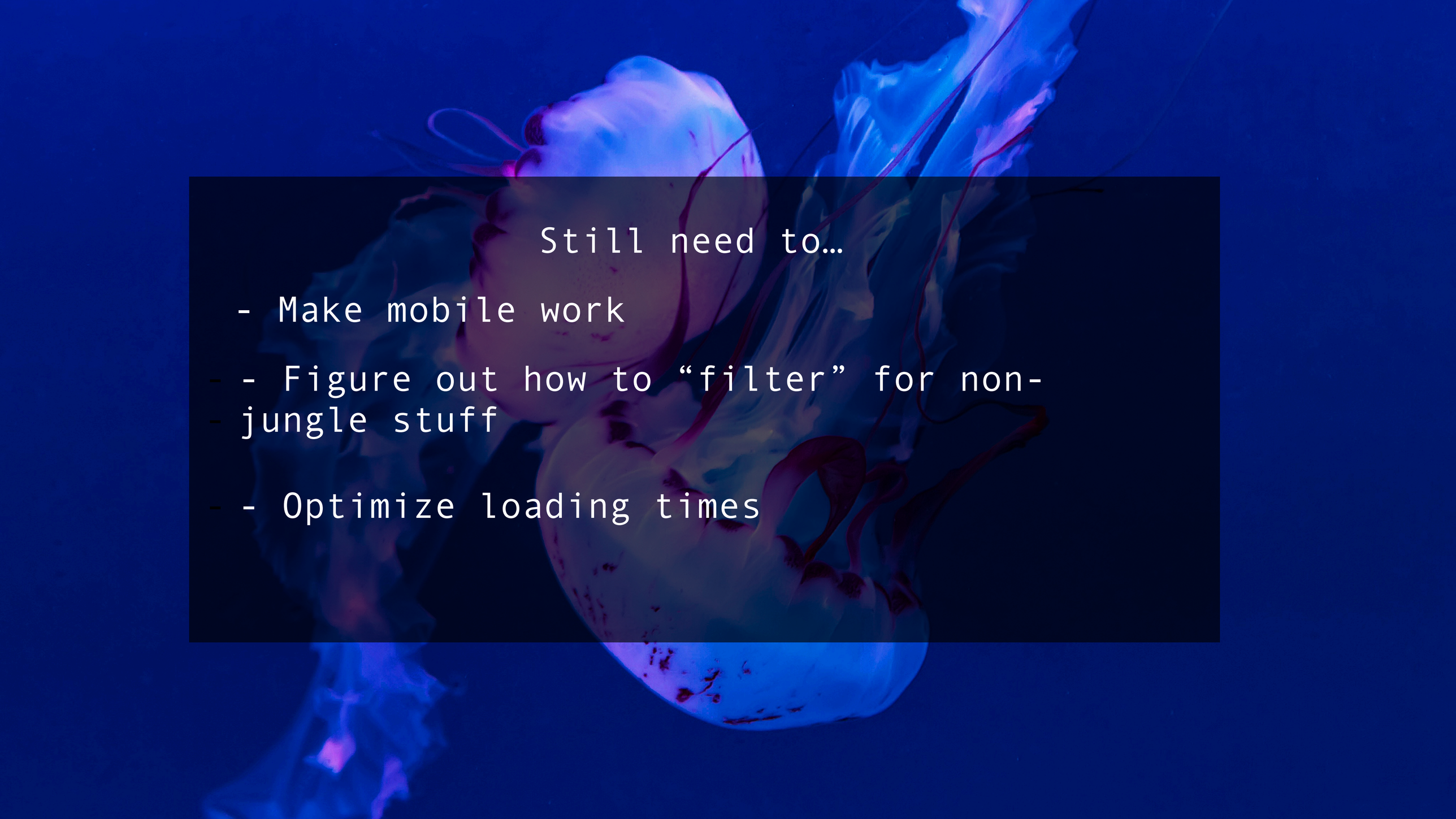
Analysis is of 41 games as Nocturne padded with 259 other games (if jungle => of junglers else nothing is padded) in divisions ['SILVERI', 'GOLDIV', 'GOLDIII', 'GOLDII', 'GOLDI']. The number on top of the graph represents: how likely or unlikely was this game to happen at all, given our data model?

Data is based off your past game data combined with anyone within 2 divisions of your rank (last updated patch 11.4), and 20-30% of sample data is just for that champion.

The red bars and their relative sizes indicate which things about this game DID help your log-odds chances of winning this game and by how much, and the blue bars are what aspects DID NOT help your log-odds chances and by how much.

“Time for a live demo”

-Gandalf



Still need to…

- Make mobile work
- - Figure out how to “filter” for non-jungle stuff
- - Optimize loading times