

# Forecasting Player Trends of Top Steam Games using Prophet

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## **Overview**

#### Purpose:

- Predict average monthly player counts for CS2, Pubg and Dota2.
- Identify genre-level trend over time

#### Variables:

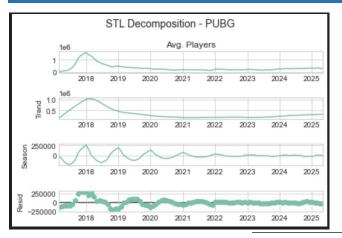
- Avg. Players (target)
- Patch\_Count and Google\_Trends\_Index (external regressors)

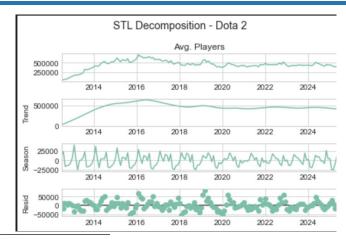
#### Tools and methods:

- Using request, BeautifulSoup, pytrends to extract data
- Using Prophet which is a time series forecasting model developed by Facebook.
- The api is created through Flask and hosted in Google Cloud Run



# Seasonal and Trend decomposition using Loess





STL Decomposition - CS2





### **Predicted Result**

```
'game": "dota2",
  "months": 10,
  "Patch_Count": 5,
  "Google_Trends_Index": 70
 ' http://localhost:5001/predict
[{"ds":"Sun, 01 Jun 2025 00:00:00 GMT","yhat":452392.6083055851},{"ds":"Tue, 01
Jul 2025 00:00:00 GMT","yhat":412035.4225222018},{"ds":"Fri, 01 Aug 2025 00:00:0
0 GMT", "yhat":352809.0392150729}, {"ds": "Mon, 01 Sep 2025 00:00:00 GMT", "yhat":29
3265.02581051894},{"ds":"Wed, 01 Oct 2025 00:00:00 GMT","yhat":221260.0555628068
4},{"ds":"Sat, 01 Nov 2025 00:00:00 GMT","yhat":203163.74105366057},{"ds":"Mon,
01 Dec 2025 00:00:00 GMT", "yhat":155108.85334136907}, {"ds":"Thu, 01 Jan 2026 00:
00:00 GMT", "yhat":130377.96630508582}, {"ds":"Sun, 01 Feb 2026 00:00:00 GMT", "yha
t":68273.70191638486},{"ds":"Sun, 01 Mar 2026 00:00:00 GMT","yhat":35533.1988231
   "aame": "cs2",
   "months": 10,
   "Patch_Count": 5,
   "Google_Trends_Index": 70
  ' http://localhost:5001/predict
 [{"ds":"Sun, 01 Jun 2025 00:00:00 GMT","yhat":1374827.4236285184},{"ds":"Tue, 01
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 :00 GMT","yhat":1660085.3381260224},{"ds":"Mon, 01 Sep 2025 00:00:00 GMT","yhat'
 :1772161.363788191},{"ds":"Wed, 01 Oct 2025 00:00:00 GMT","yhat":1860043.4938486
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 01 Dec 2025 00:00:00 GMT", "yhat":2272265.461100732}, {"ds": "Thu, 01 Jan 2026 00:
00:00 GMT", "yhat": 2699578.818491059}, {"ds": "Sun, 01 Feb 2026 00:00:00 GMT", "yhat
  :2976357.00632786},{"ds":"Sun, 01 Mar 2026 00:00:00 GMT","yhat":3149230.4335965
```

The average player counts for dota2 is gradually decreasing after ten months starting from June 1st 2025, while CS2 shows a sharp upward trend.

The possible reason for this huge increase is because I set the changepoint scale for Prophet as 1, which increase sensitivity to recent trend shift.

# **Conclusion**

- The average player counts for CS2 and Pubg is still increasing in the future, but the number of players of Dota2 is decreasing.
- We can imply that in the future, less people will play moba games. And FPS and Battle Royale is still hot genre for games. This might support game developers in content planning.
- Future work: Adding more interesting variables like Twitch Viewers to improve the accuracy of the model and tried some other models such as XgBoost to compare.

