



eSPORTS
— S U M M I T —

Live eSport-Analytics

Solving the Informational Fairness Conundrum

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GDC¹⁶

GAME DEVELOPERS CONFERENCE March 14-18, 2016 · Expo: March 16-18, 2016 #GDC16



DOJO MADNESS

- eSports tools
- Help gamers to master their play
- Gaming enthusiasm and machine learning
- Located in Berlin



COACHING &
TRAINING

DATA SERVICES

PROFESSIONAL
TOOLS

ENTERTAINMENT
& BROADCAST

TALK OUTLINE

- Analytics in (e)Sports
- The role of big data & machine learning
- Informational fairness



BRIEF HISTORY

- 1970's Sabermetrics MLB
- 2003 Moneyball, Billy Beane Oakland A's
- 2005 first issue of the *Journal of Quantitative Analysis in Sports*
- Sloan Sports Analytics Conference from 175 (2007) to 3,200 (2015)
- 2014 more data gathered in the NBA than in 67 years before



ASPECTS OF ANALYTICS

- Analytical domains
 - Performance rating
 - Coaching
 - Game literacy
 - Fan engagement
 - Business management
- Channels
 - Team internal
 - Public
 - Broadcast

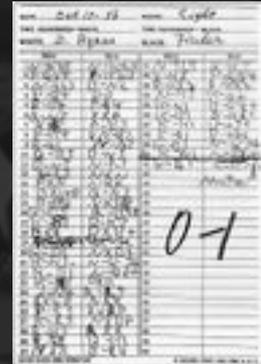


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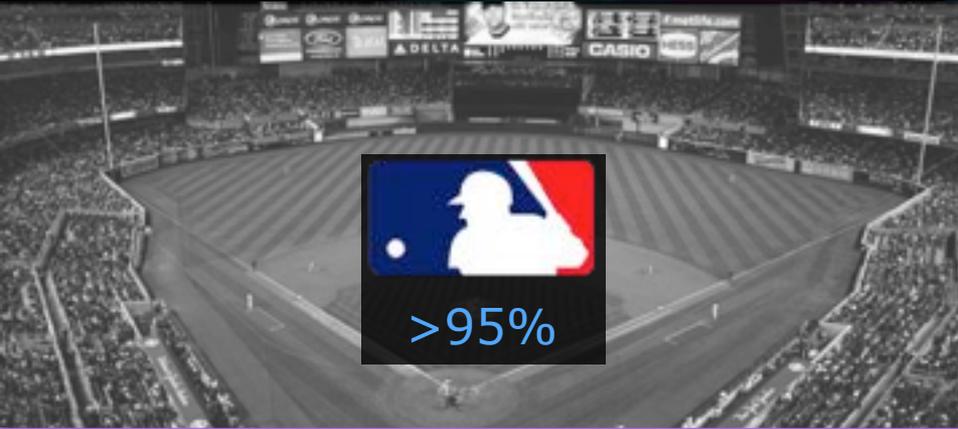


59% of sports fans track player or team statistics



0-1





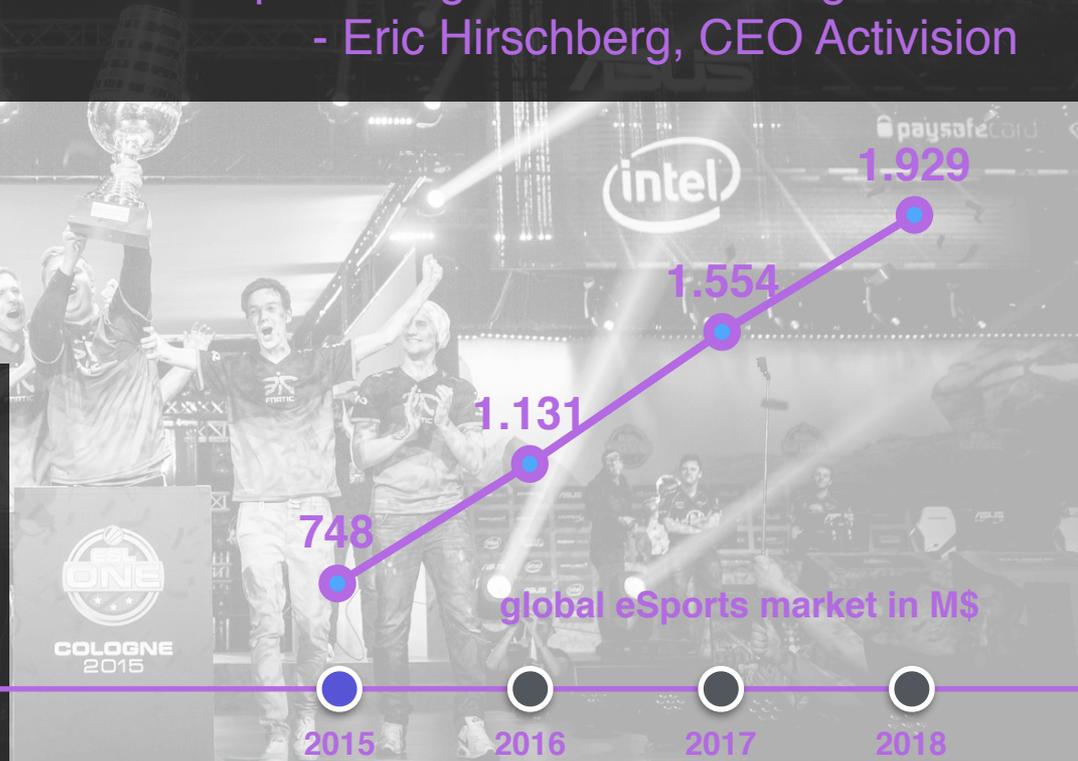
"Games have become the biggest unofficial sports league in the world right now."
- Eric Hirschberg, CEO Activision

Compound
revenue
growth

+34% p.a.

Compound
audience
growth

+20% p.a.



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“Big Data forces you to change the way you collect, store, manage, analyze and visualize data” - Carlos Somohano, Data Science London

30M daily active MOBA users
~50-150MB data per game



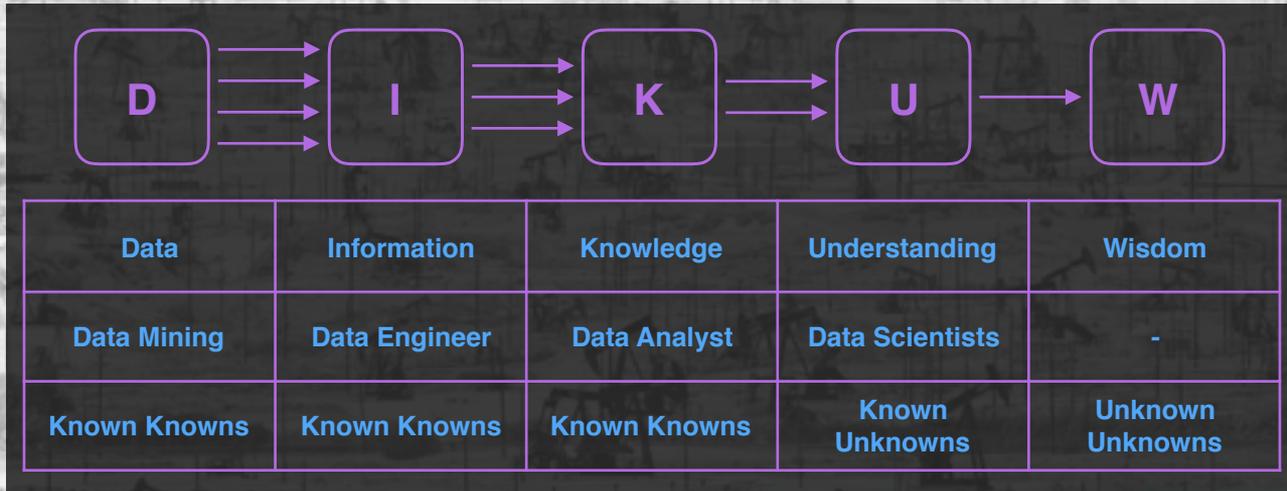
volume + velocity + variety + veracity



value?



We don't have a big data revolution, but a dumb data situation. Until we can get hold of relevant information, it is just extra weight.



MACHINE LEARNING

"A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P , if its performance T , as measured by P , improves with experience E "

– T. Michell (1997)

T: Win the game

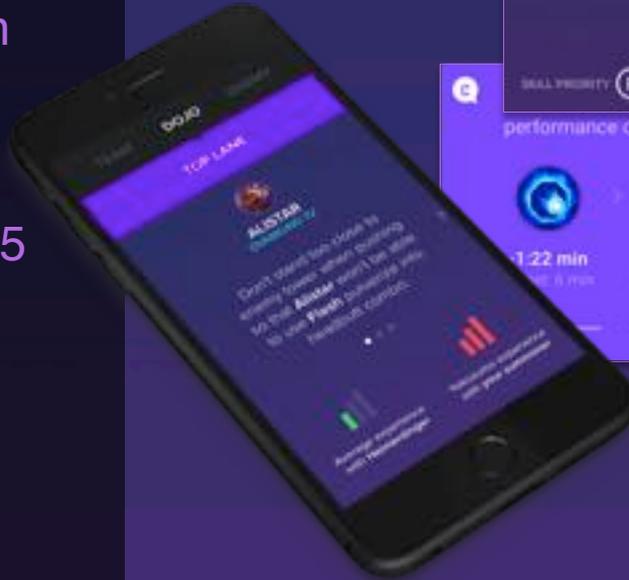
P: Scored points

E: Players' movements, ...



LOLSUMO

- Companion app for LoL
- Dynamic guide generation
- Personalized analytics
- Performance feedback
- Launched globally 08/2015
- 30k daily active users
- Best rated LoL app



DeepLearning for guide generation I



Collect and “clean”
real world in-game
data

5M matches
1day

Model item
synergies/strengths
as deep CNN

Offline training
few min.

Deploy Win-
likelihood predictor

Cloud PaaS
few min.

Live query
of unseen builds

API
real-time

DeepLearning for guide generation II

- Champion
- Champion
- Items
- Abilities
- Lane
- Gold
- Experience
- ...



4.7

★★★★★

1234567

★★★★★

Great App

I think this is a great tool for League of Legend players. I know exactly where I have to improve a champion in-game, and I've actually improved skills ever since I started using this app. I just wish that the stats came up faster after you've finish game, but that's fine. I really recommend this a any LOL player as a really helpful accessory.

★★★★★

Absolutely Fantastic For any thinking of getting this app, think no more, because once you install this god of an app, you hit that big button and GG, games already over. This app includes all the information needed in order to successfully beat any enemy that stands in your lane. Happy winning. see you in the rift.

It is amazing

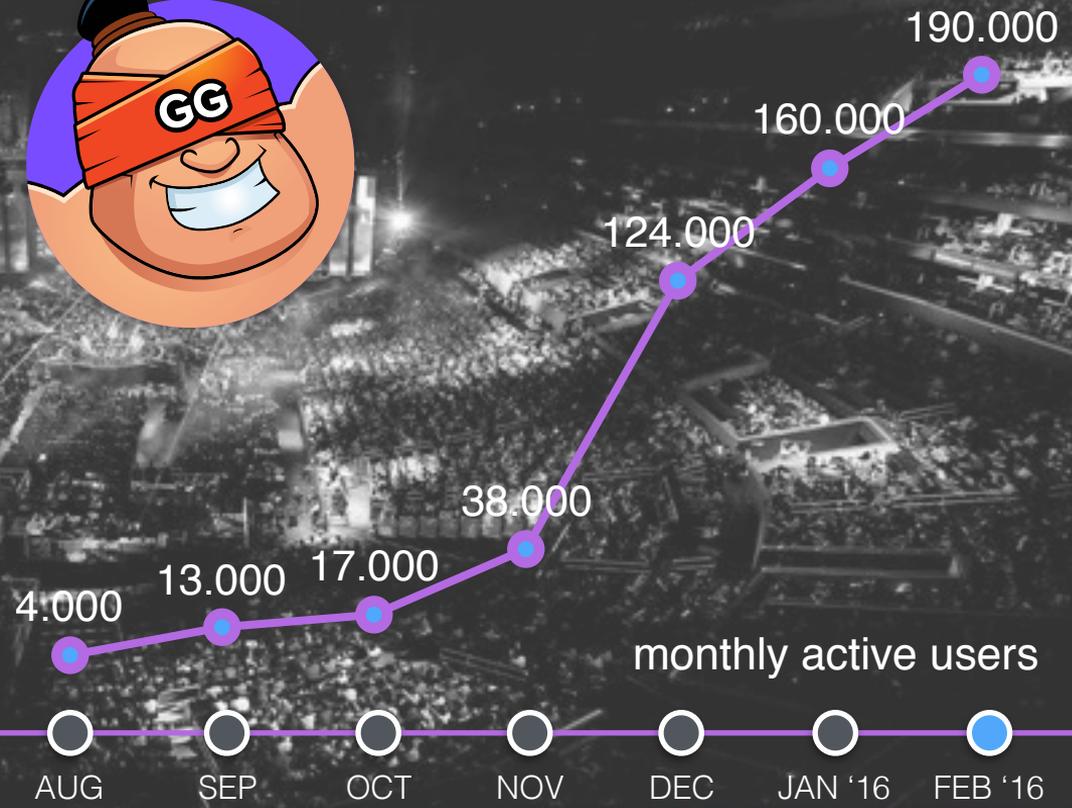
★★★★★ - by User Field - 20160113

This app is so unique and cool, it really makes me want to improve and makes each game a challenge to beat the last, thank you developers ♥

I LOVE LOLSUMO!!!!!!

★★★★★ - by Flankon - 20160105

This game has helped me win SOOOOOOO many matches, and I've learned about who I am friends with. Although some may call it "cheating", it's really not. The point of playing League matches is to raise your level, rank, and skill in the game, while having fun.



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Results
historical data

Rankings/odds



Run of game
in-game data

Descriptive
statistics



Contextual data
personalized

Predictive
analytics



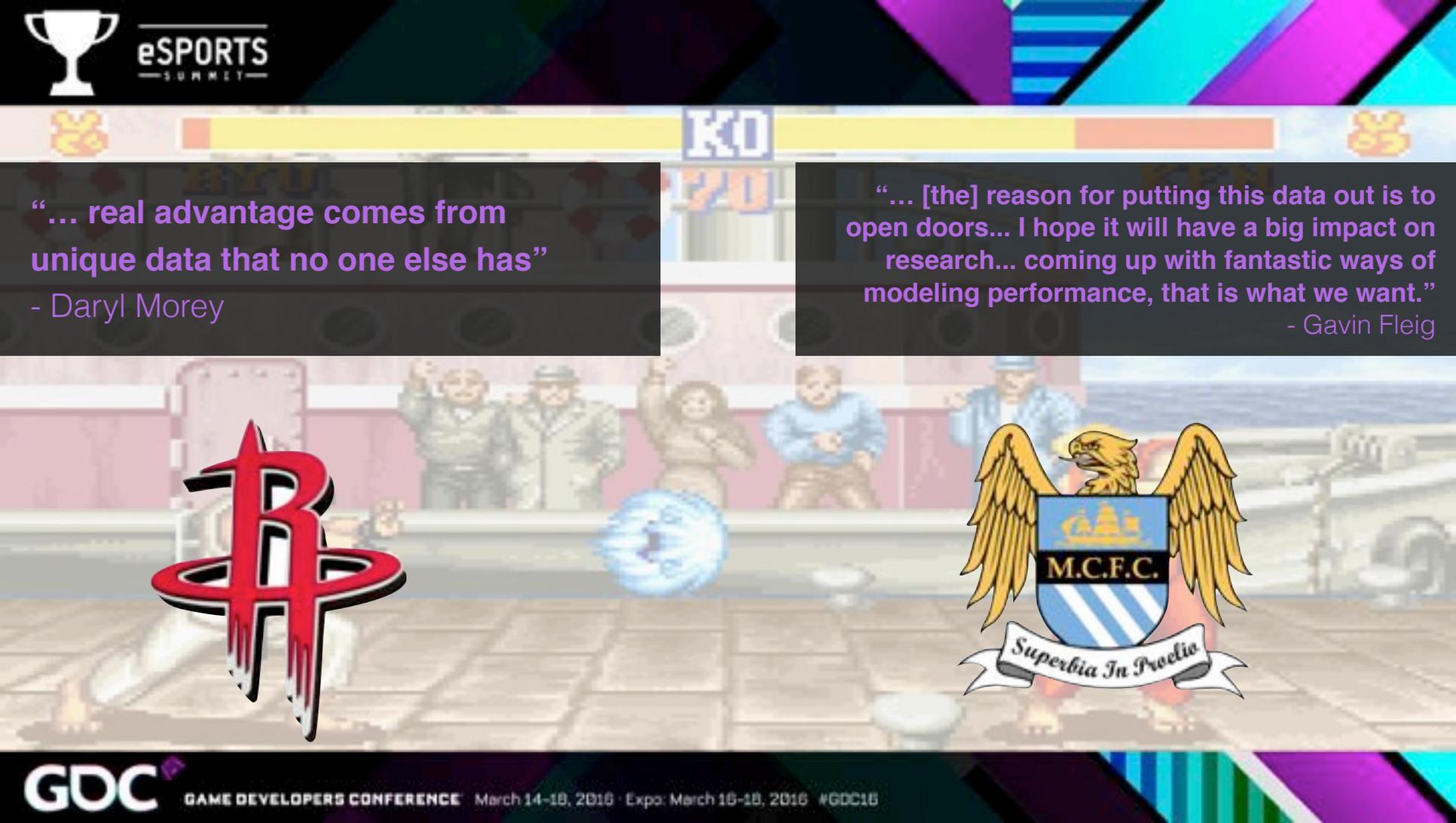
Live data
real-time

Prescriptive
modelling

“There’s nothing to be scared of in open data. Unless you’re taking money where you shouldn’t be taking money.” - Peter Corbett, CEO iStrategyLabs

Video streams	✓
Replays/ Combat Logs	✓
API support	✓
Live data streams	✗
SLA	✗





“... real advantage comes from
unique data that no one else has”

- Daryl Morey

“... [the] reason for putting this data out is to
open doors... I hope it will have a big impact on
research... coming up with fantastic ways of
modeling performance, that is what we want.”

- Gavin Fleig



360°: LONG, WIDE, DEEP

- Long: all matches including training, skirmishes, etc.
→ draft analysis, social KPIs
- Wide: APM, heart-rate, sleep, nutrition, fan impact, etc.
→ injury/burnout prevention
- Deep: fine granularity and higher sample rate
→ data silos for the future



BREAKING GAMES

- DefCon 22 - “I am a legend: Hacking Hearthstone with machine learning”
- Open data initiative
- Binding rulebook by the publisher
- Code of conduct for eSport analytics



Predicted deck

0	Backstab	27.29
1	Deadly Poison	18.27
2	Eviscerate	15.92
0	Preparation	13.5
3	St7 Agent	1.36
5	Azure Drake	0.95
1	Sinister Strike	0.92
3	Earthen Ring Farseer	0.88
3	Fan of Knives	0.84



“The future is already here — it's just not evenly distributed.” - William Gibson, Writer



Open data for
data analysis

Common formats
and data points

Rich and multi-
faceted data

AI coaching tools
and game hooks

eSport analytics, the question is not “Will it happen?” but “To whom, at what prize?”

WORK IN PROGRESS

- Personalized, automated performance coaching
- Synergies in team context
- Emotional aspects of eSport
- Telling better stories with data
- More actionable insights
- Build confidence in data driven decisions




LOLSUMO LOLSUMO TeamGuide shared by Doublelith [NA] [GET LOLSUMO](#)

Your Team: Select your champions to see the Full Team Guide

GET YOUR TEAM IN
Increase your chance to win up to 90%

Champion	Recent Champion Performance	Core Items	Skill Priority	Flag
Annie	Challenger	[Items]	[Skills]	Strong Clear
Ahri	Challenger	[Items]	[Skills]	On Promotion Game
Singed	Recent	[Items]	[Skills]	Strong Clear
Blitzcrank	Platinum	[Items]	[Skills]	Strong Clear
LeeSin	Gold	[Items]	[Skills]	Strong Clear

CONCLUSIONS

eSports market is fast growing and with it the relevance of analytics

Big Data + ML lead to predictive analytics, real competitive edge

Code of conduct needed to create mutual assurances

Data is still incomplete and hard to acquire - closing the 360° cycle

Cooperation between analysts & publishers to avoid pay-to-win



DOJO MADNESS

MASTER YOUR PLAY

*Data wizards and back-
end muggles welcome!*



QUESTIONS?

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IMAGE SOURCES

- Stadium: motherboard.vice.com/read/esports-has-a-ddos-problem
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