UMS-RECOMMENDER TEAM

Team Lead — Chengyu Dai

“

UMS photos taken without permission. Don’t sue me!!!

-Chengyu

“

UMS has deployed targeted ads on Google / Youtube / Facebook, ***<u>WHY</u>*** can MDST contribute anything to their marketing at all?

-Nobody said that

EXTRA DATA ON . . .

Customer

Performances

Purchase History

Purchase Time Pattern

DEEP DIVE INTO DATA

UNIVERSITY
record
January 15, 1973

Tapestries inside

CUSTOMERS

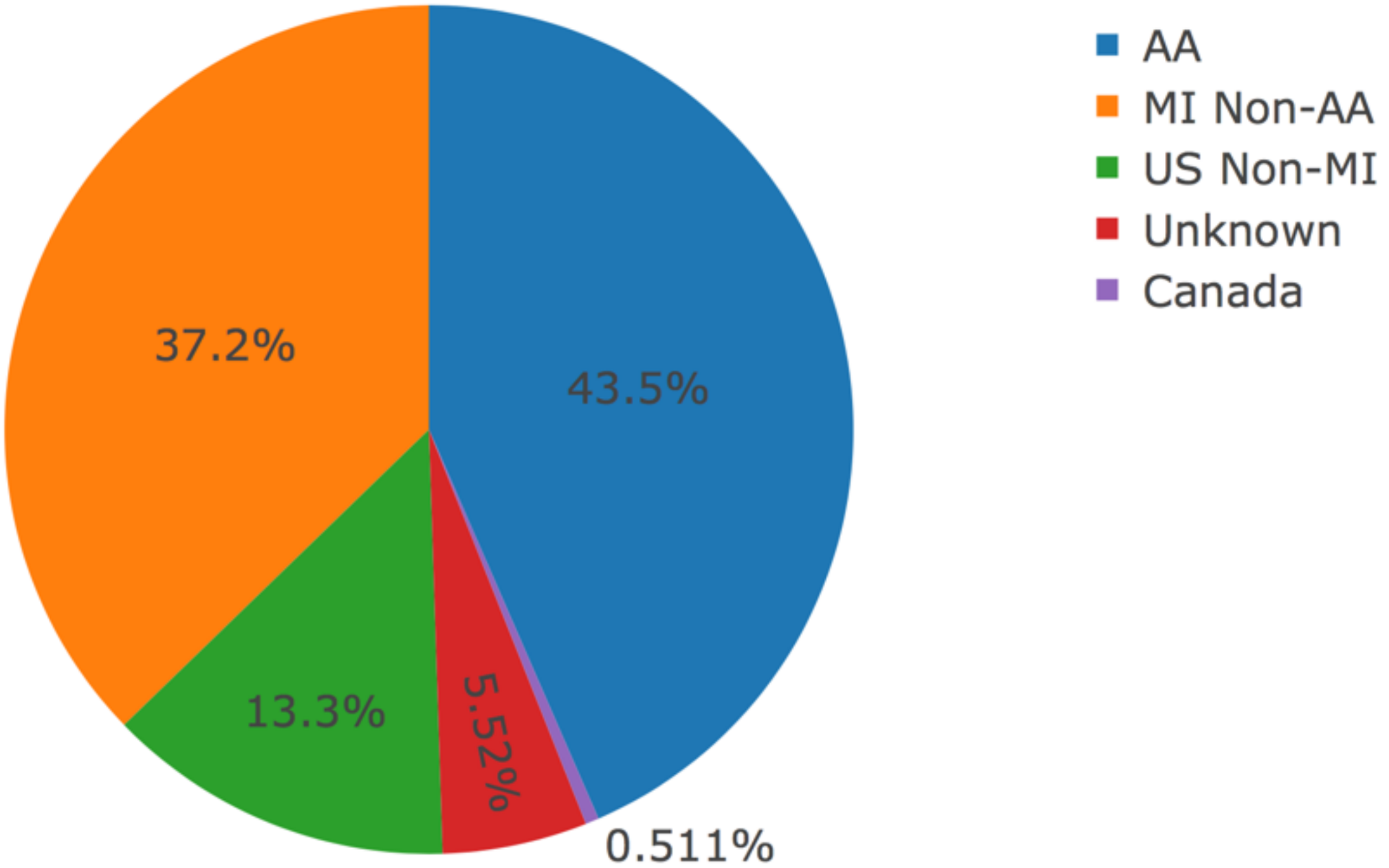
by Wenbo, Chrisy, Chengyu& Tejas

“

To inspire individuals and enrich **communities** by connecting audiences and artists in uncommon and engaging experiences.

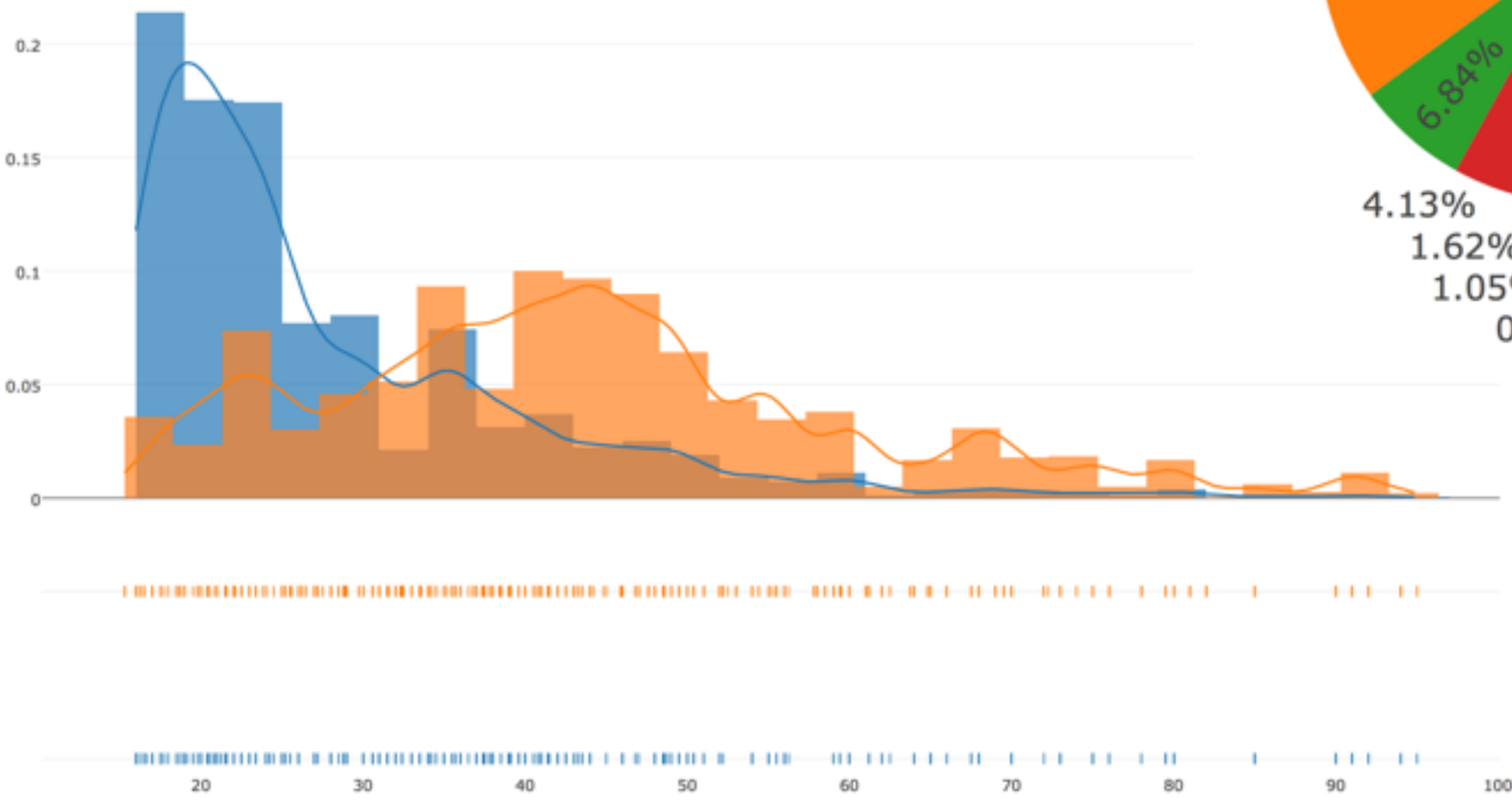
-UMS Mission Statement

Geographic Composition of Customers



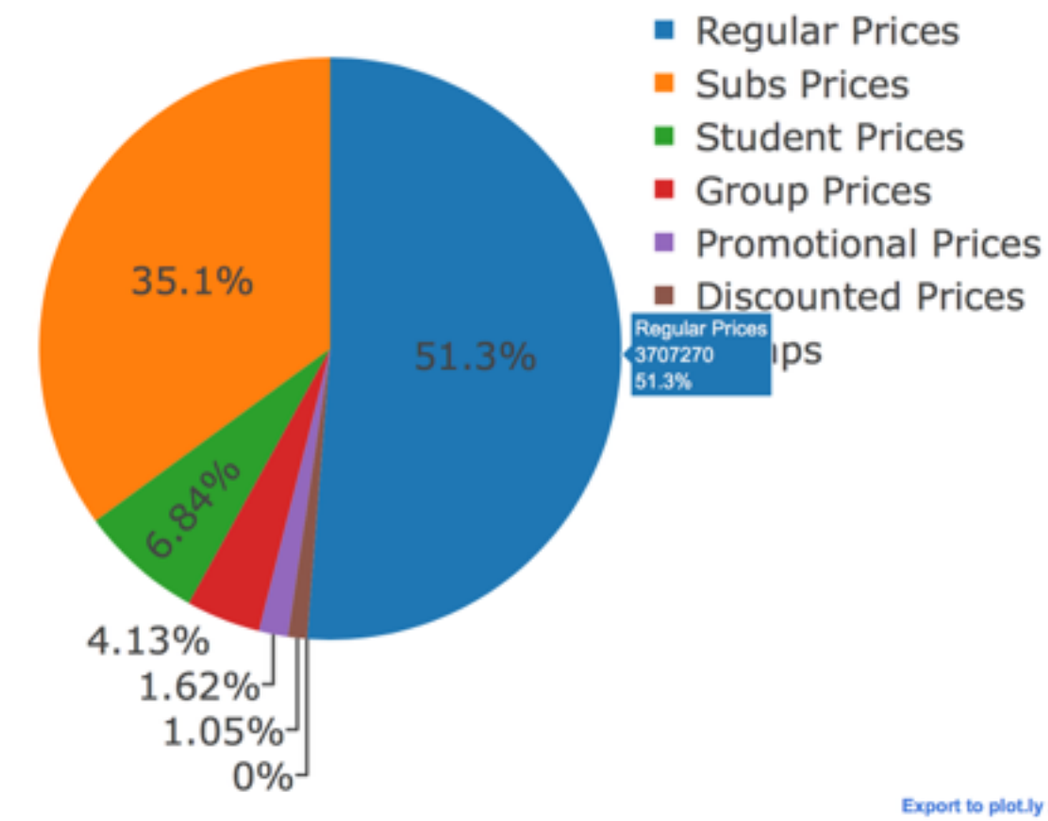
Export to plot.ly »

Average per seat price histogram for student & non-student members



Export to plot.ly »

Income Composition by Price Groups



Export to plot.ly »

PERFORMANCES

by Sean

Occupancy rate (color) & Revenue (size) for each performance across time

Occupancy_Rate

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1

Performance Group

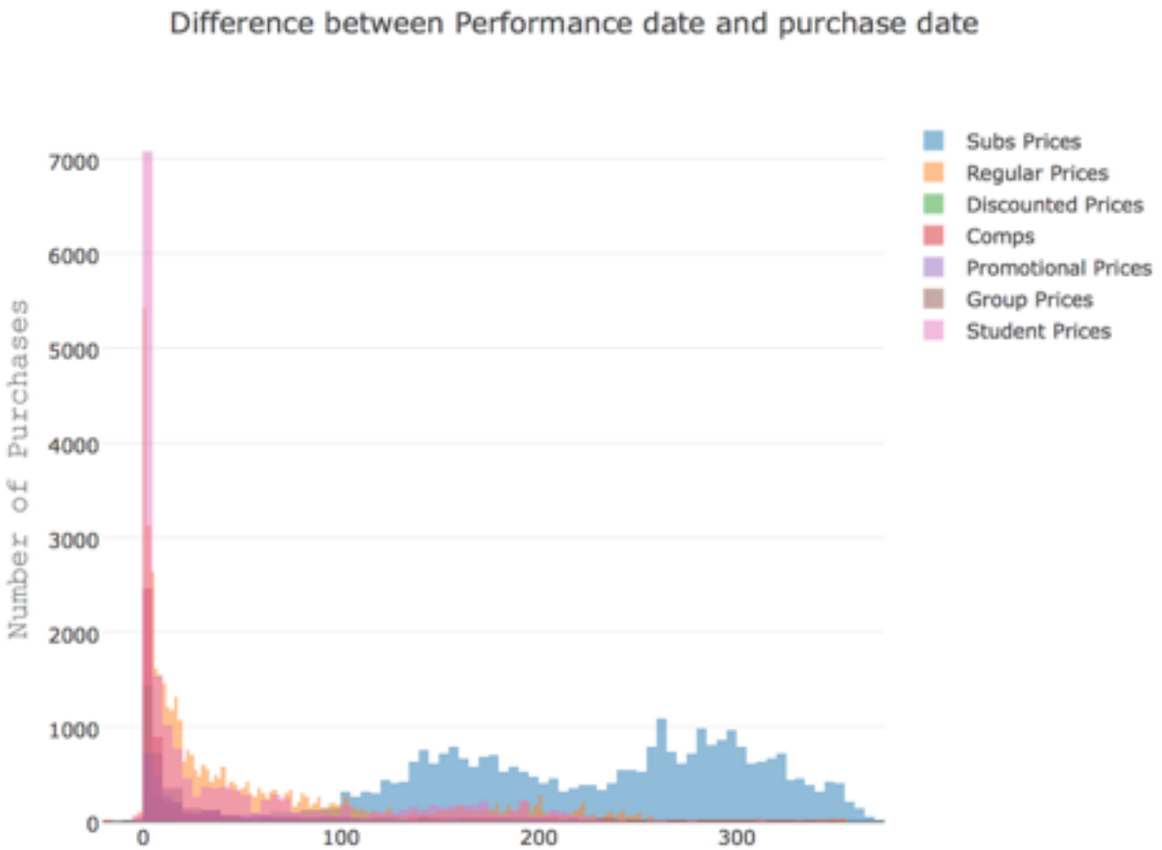
Jan 2012
Jul 2012
Jan 2013
Jul 2013
Jan 2014

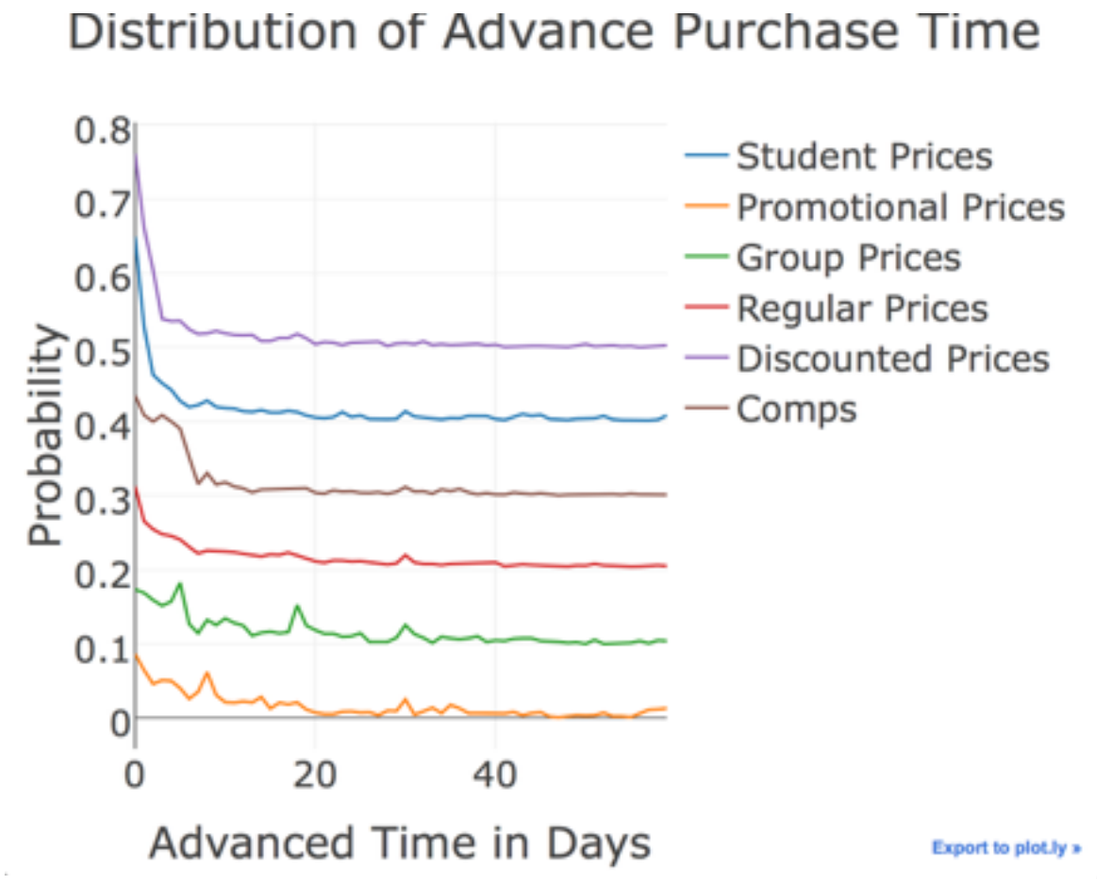
Performance Date

WE
CAN
ANSWER
PRACTICAL QUESTIONS

WHEN TO START A CAMPAIGN

by Wenbo, Sheng & Chrisy

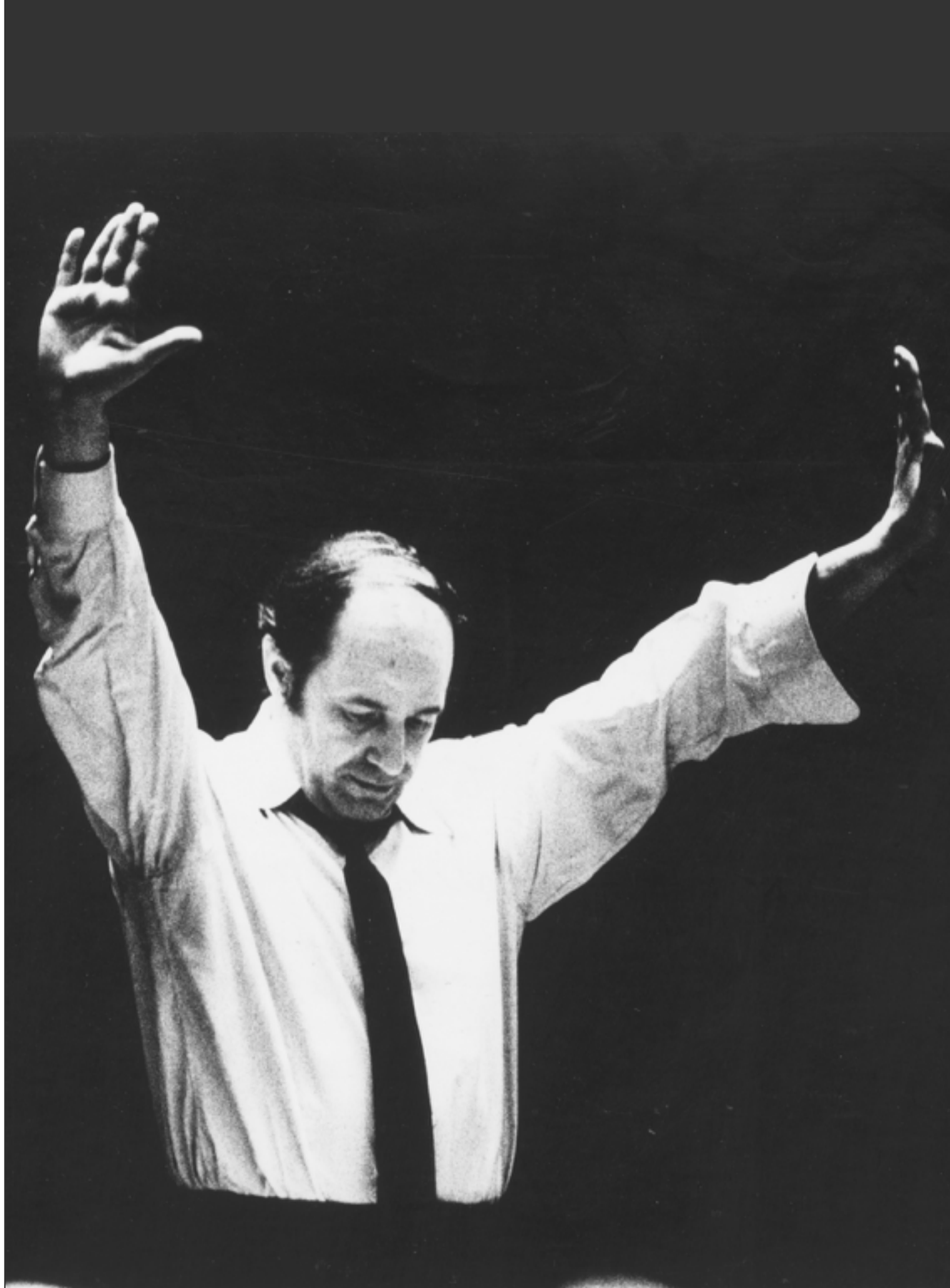

Difference between Performance date and purchase date
Number of Purchases
7000
6000
5000
4000
3000
2000
1000
0
0
100
200
300
Subs Prices
Regular Prices
Discounted Prices
Comps
Promotional Prices
Group Prices
Student Prices


Distribution of Advance Purchase Time
Probability
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
20
40
Advanced Time in Days
Student Prices
Promotional Prices
Group Prices
Regular Prices
Discounted Prices
Comps
Export to plot.ly »

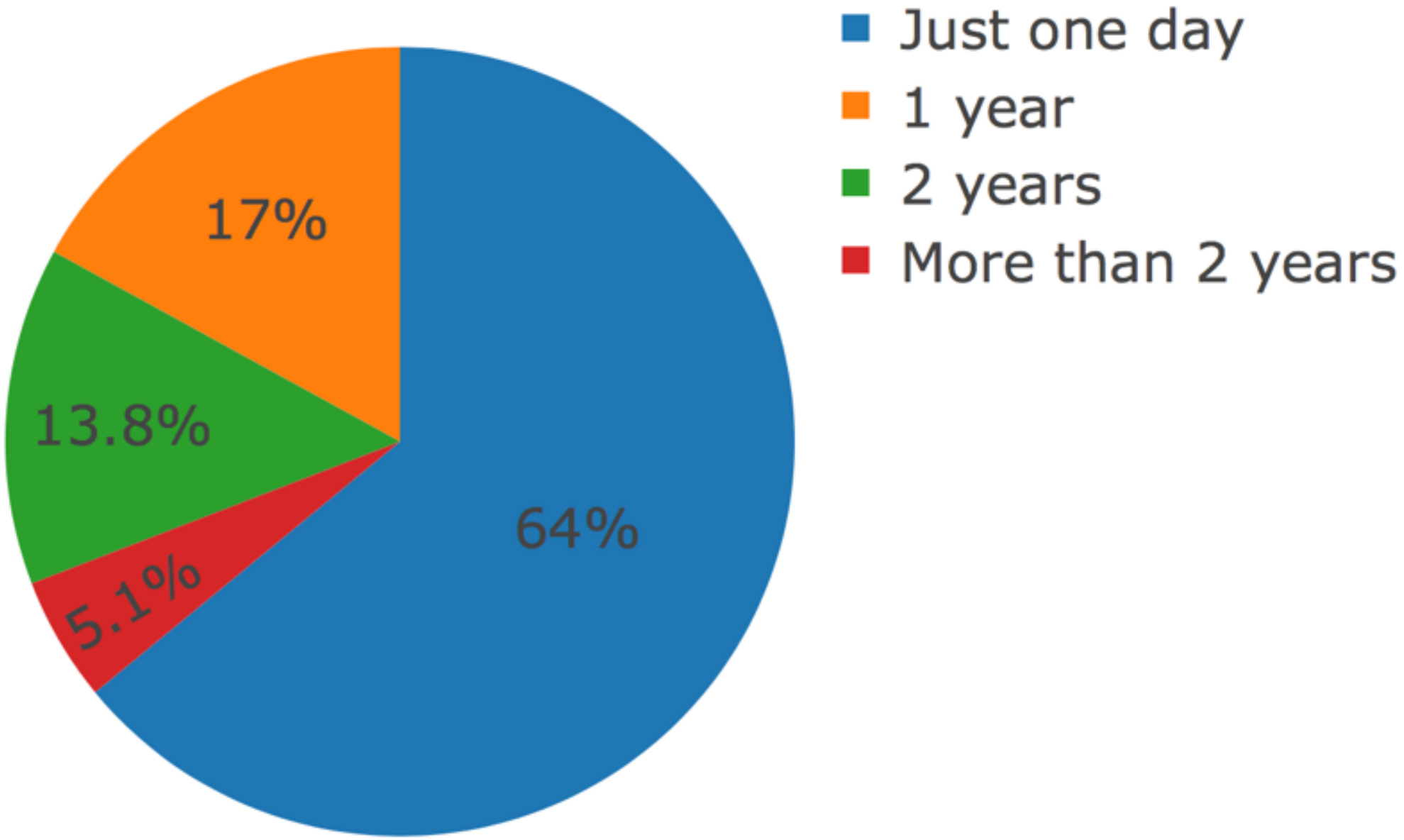
Distribution of Purchase Dates
Count
1600
1400
1200
1000
800
600
400
200
0
0
50
100
150
200
250
300
350
Purchase date
Subscription
Non-Subscription
Export to plot.ly »

WHEN TO CHECK ON "DROPOUTS"

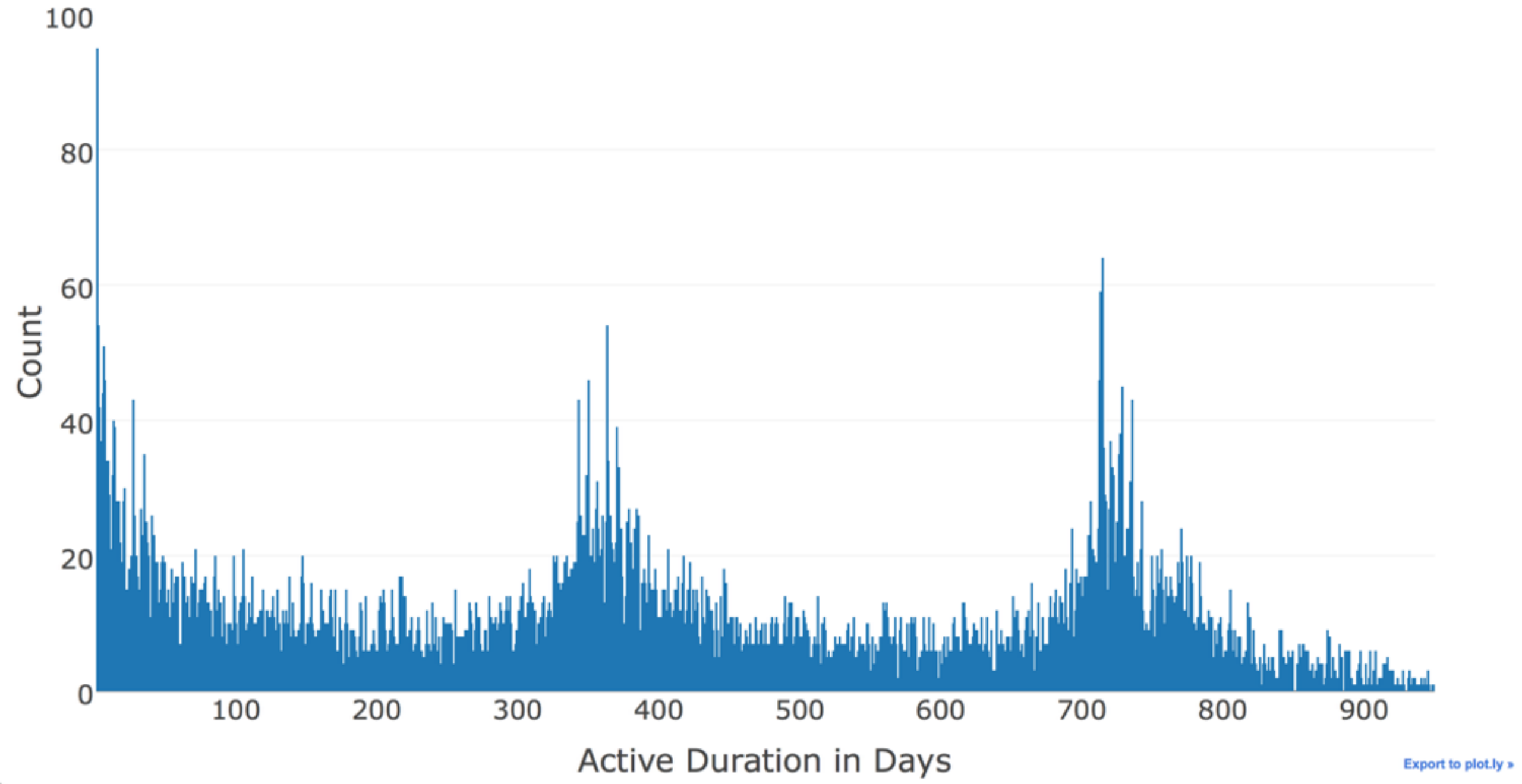
by Wenbo & Cyrus



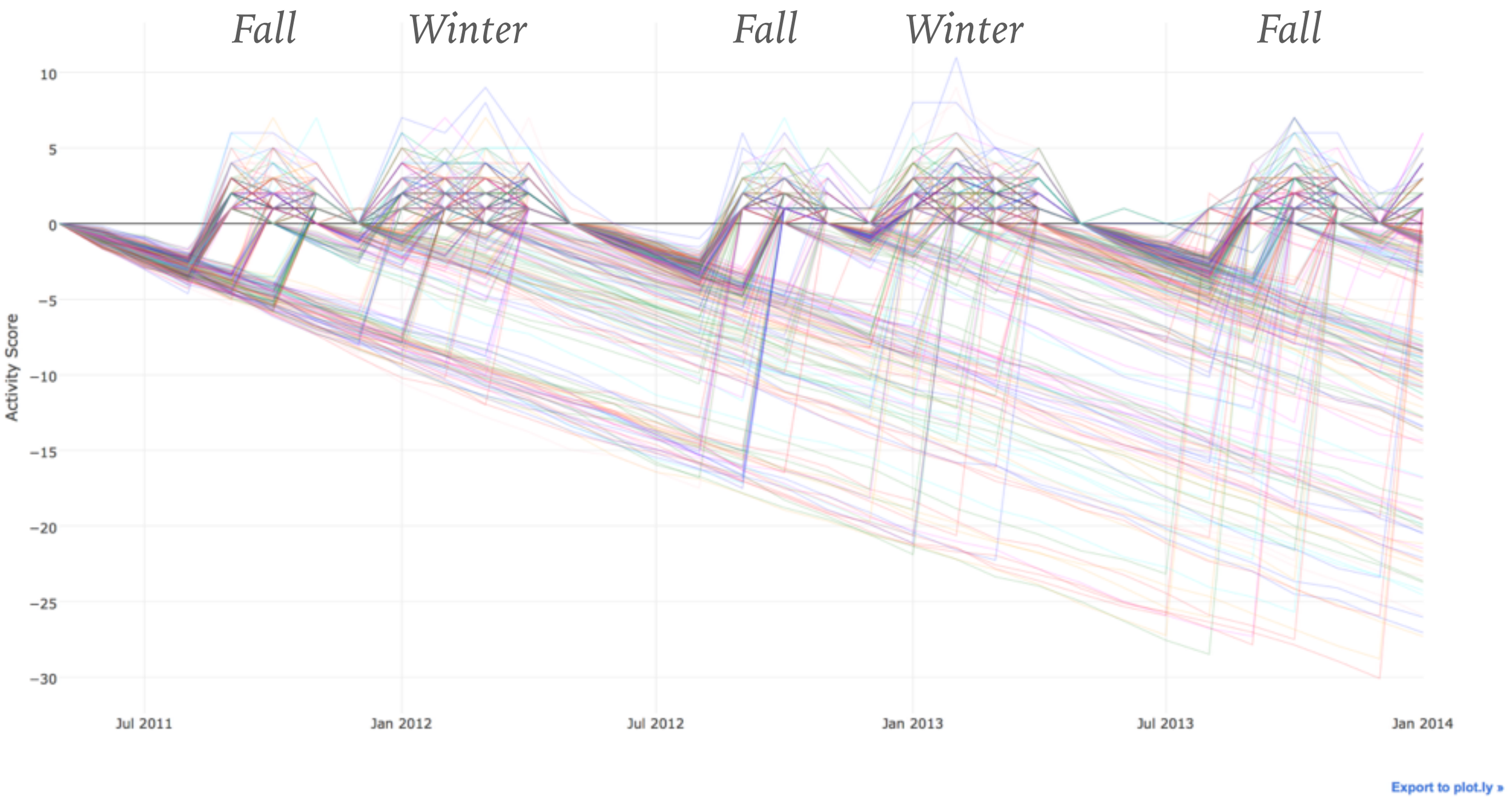
Active Duration of Customers



CUSTOMER ACTIVE DURATION'S DISTRIBUTION



ACTIVENESS SCORE FOR INDIVIDUAL CUSTOMER IN 1-MONTH PERIOD

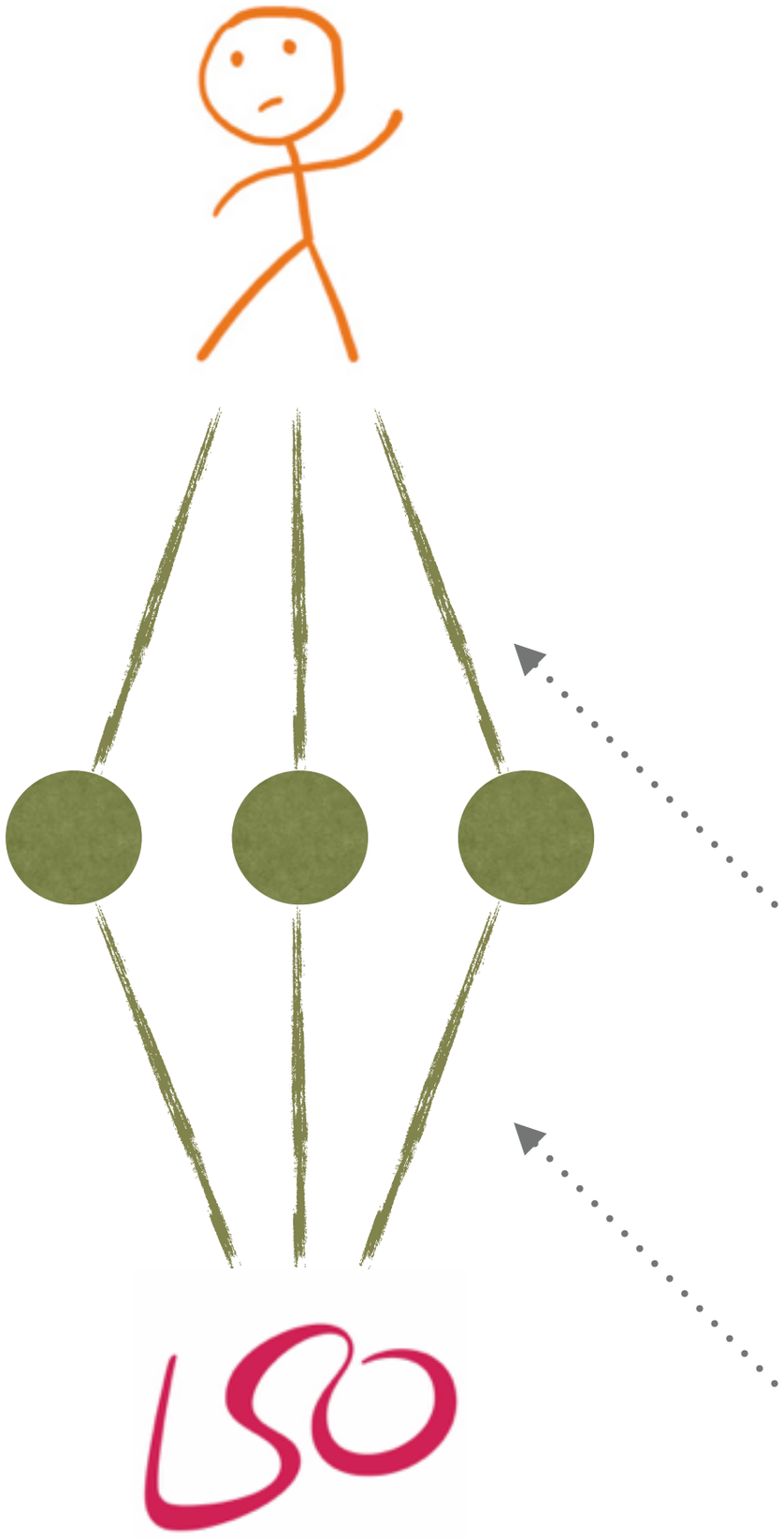


POLICY IMPLICATION

- We have great potential in bringing one-time customers back
- One week before performance is good for starting an campaign.
- No need to check on churn customers; it can be absorbed into normal ad campaign schedule.

HOW TO: PERSONALIZED ADVERTISE

by Cupjin & Chengyu

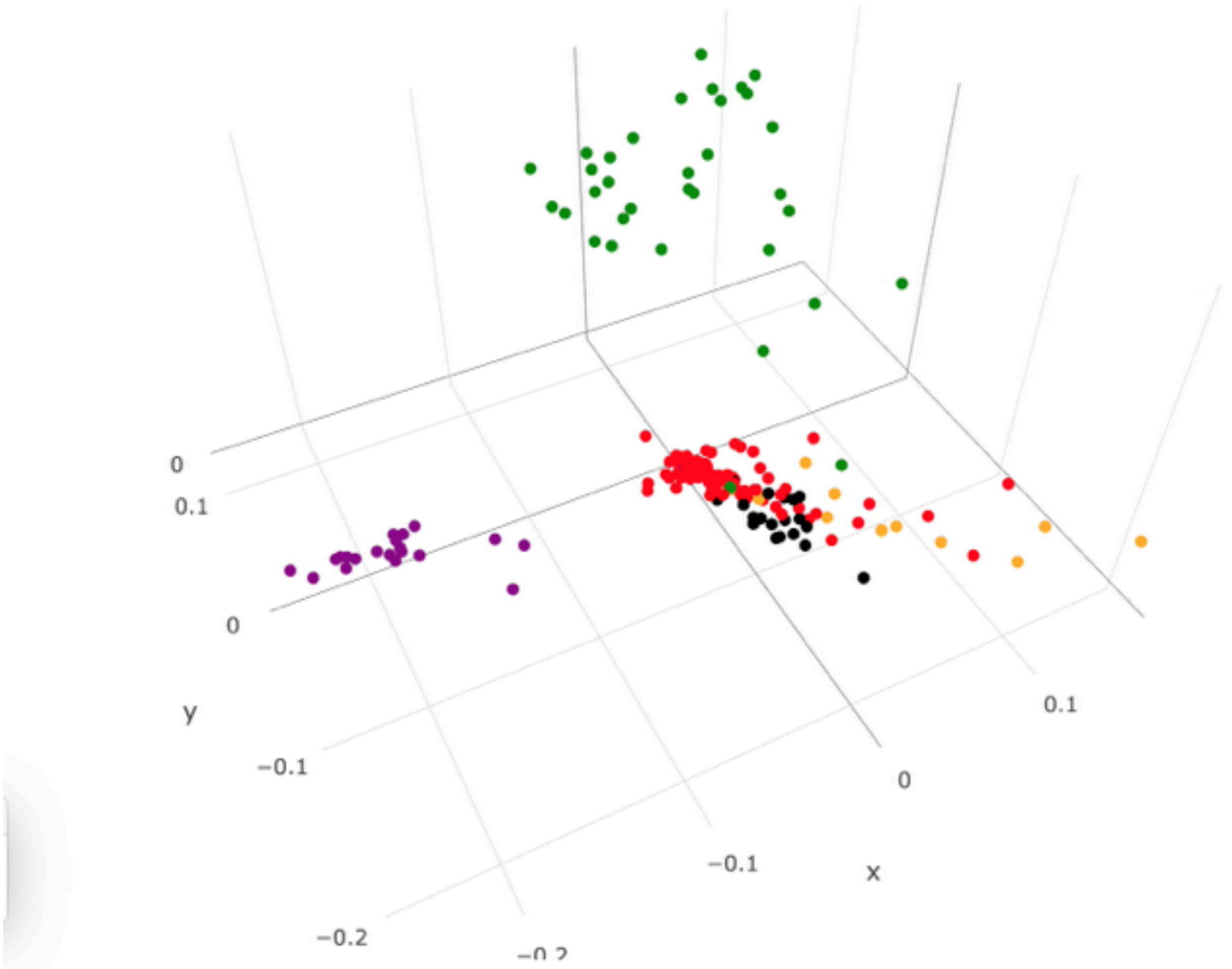


PURCHASE HISTORY

- Full ability to do Personalized Ads based on purchase history
- Matrix Factorization - Collaborative Filtering

intrinsic artistic tastes

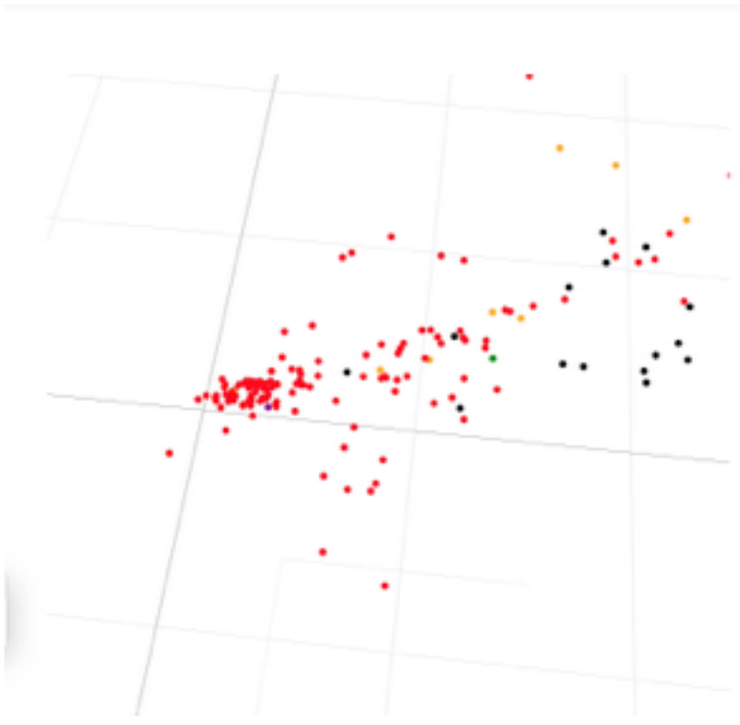
intrinsic artistic traits



Distance to origin := purchase willingness

Direction := intrinsic artistic trait

David Harrington, *Violin*
John Sherba, *Violin*
Hank Dutt, *Viola*
Sunny Yang, *Cello*

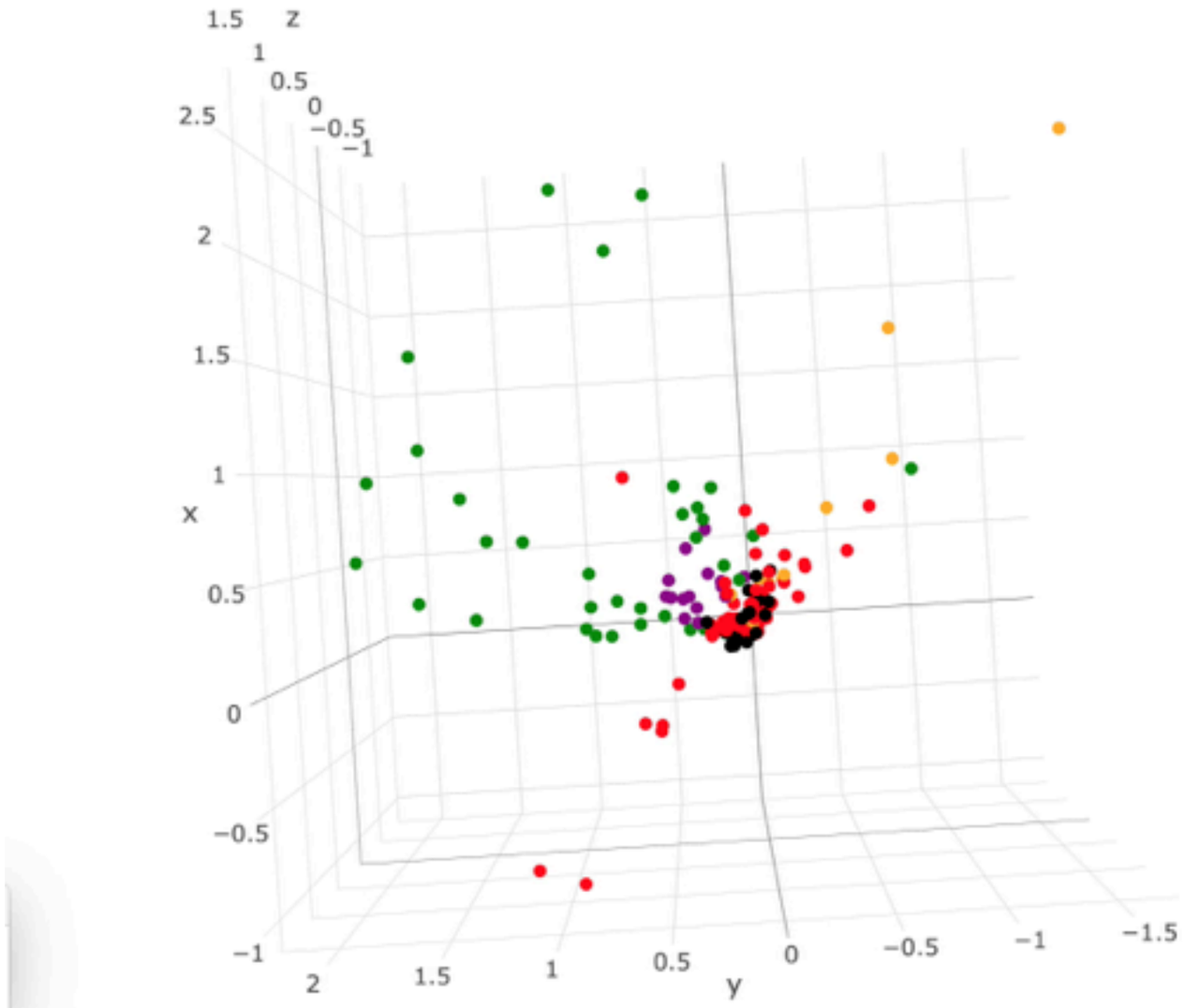


And that's the tiny tiny outlier…

“

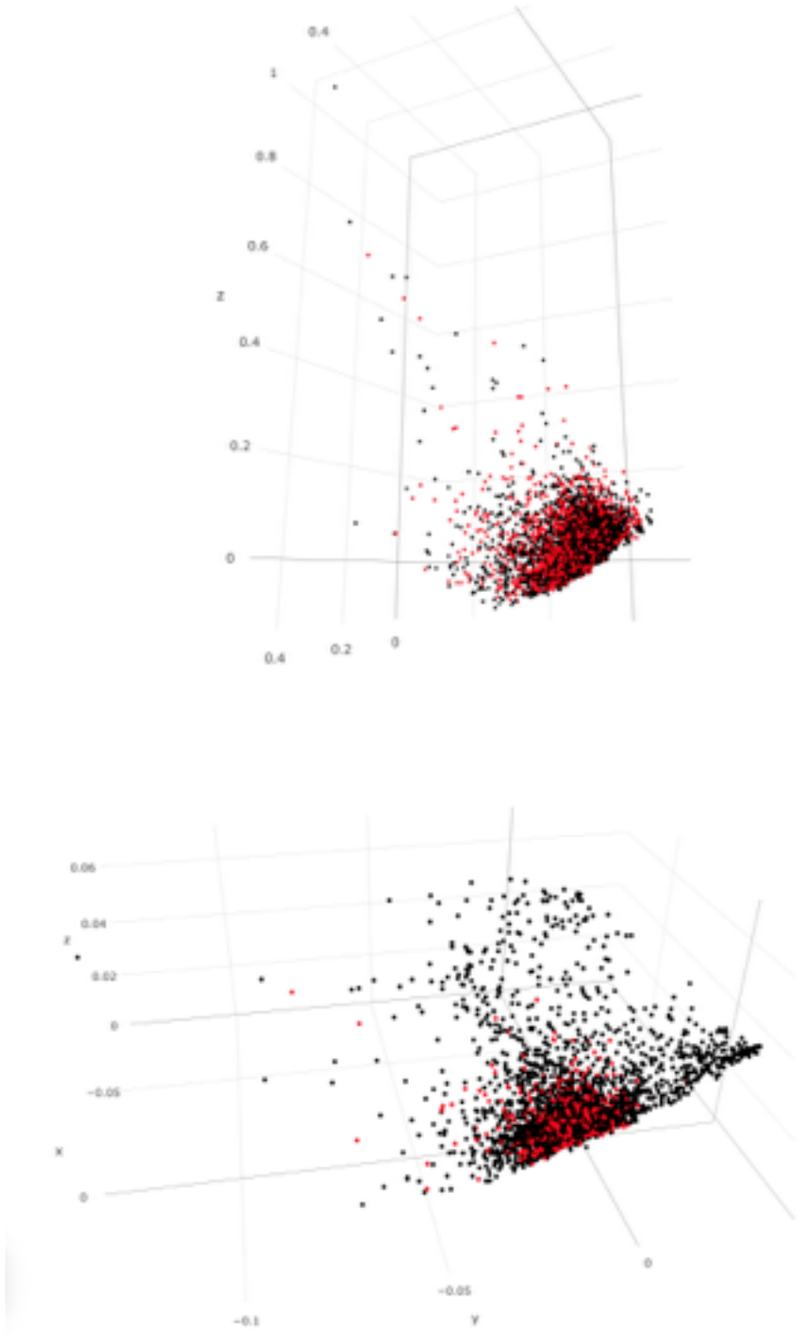
hmm dude this is nice but did you ever consider that subscription series would ***distort*** how people buy tickets

-Jonathan Stroud



More correlation between single ticket sales,

e.g. people often buy single choral union (green) and chamber arts (purple) together.



Students differ from general customer in subscription purchase only.

CONCLUSION: EXTRA DATA ALLOWS US TO UNDERSTAND…

- UMS serves a highly diverse community …
- Yet we have great potential to bring one-time customer back!
- Students have similar artistic preference to other customers.
- One week before performance is good for starting an campaign.
- No need to check on churn customers; it can be absorbed into normal ad campaign schedule.
- We built a personalized recommendation system.

“

I don’t know javascript, I mean I just started to learn…

——*URL for you to explore*——

http://ums.bidiu.me

-Zhen Xu

THE TEAM (ALPHABETICAL):

- Cyrus Anderson
- Junyu (Joey) Chen
- Chengyu Dai
- Xiyu (Chisy) Du
- Cupjin Huang
- Jacob Ketter
- Sean Ma
- Tejas Prahlad
- Wenbo Shen
- Sam Tenka
- Zhen Xu
- Sheng Yang

ums

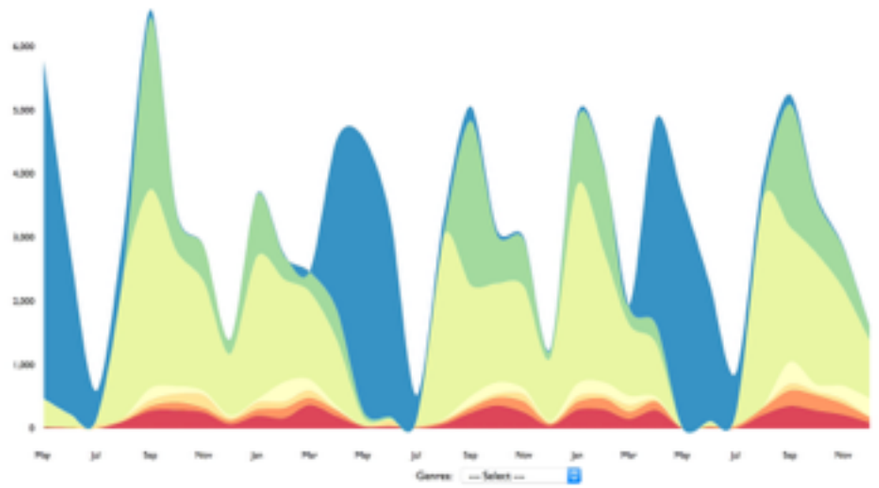
BE PRESENT

MDST

MIDAS MICHIGAN INSTITUTE FOR DATA SCIENCE UNIVERSITY OF MICHIGAN

THANKS TO

- UMS!
- Jake!
- Eric!
- Executive Committee!
- Plotly!

Explore our website

ums.bidiu.me