



**Taboola**

**AI@  
TABOOLA**

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# AGENDA

1

The Revolution of Deep Learning

2

Taboola's AI revolution

3

The AI behind SmartBid

4

Things we are working on



# REVOLUTION OF AI DRIVEN BY DEEP LEARNING

Machines that learn things on their own

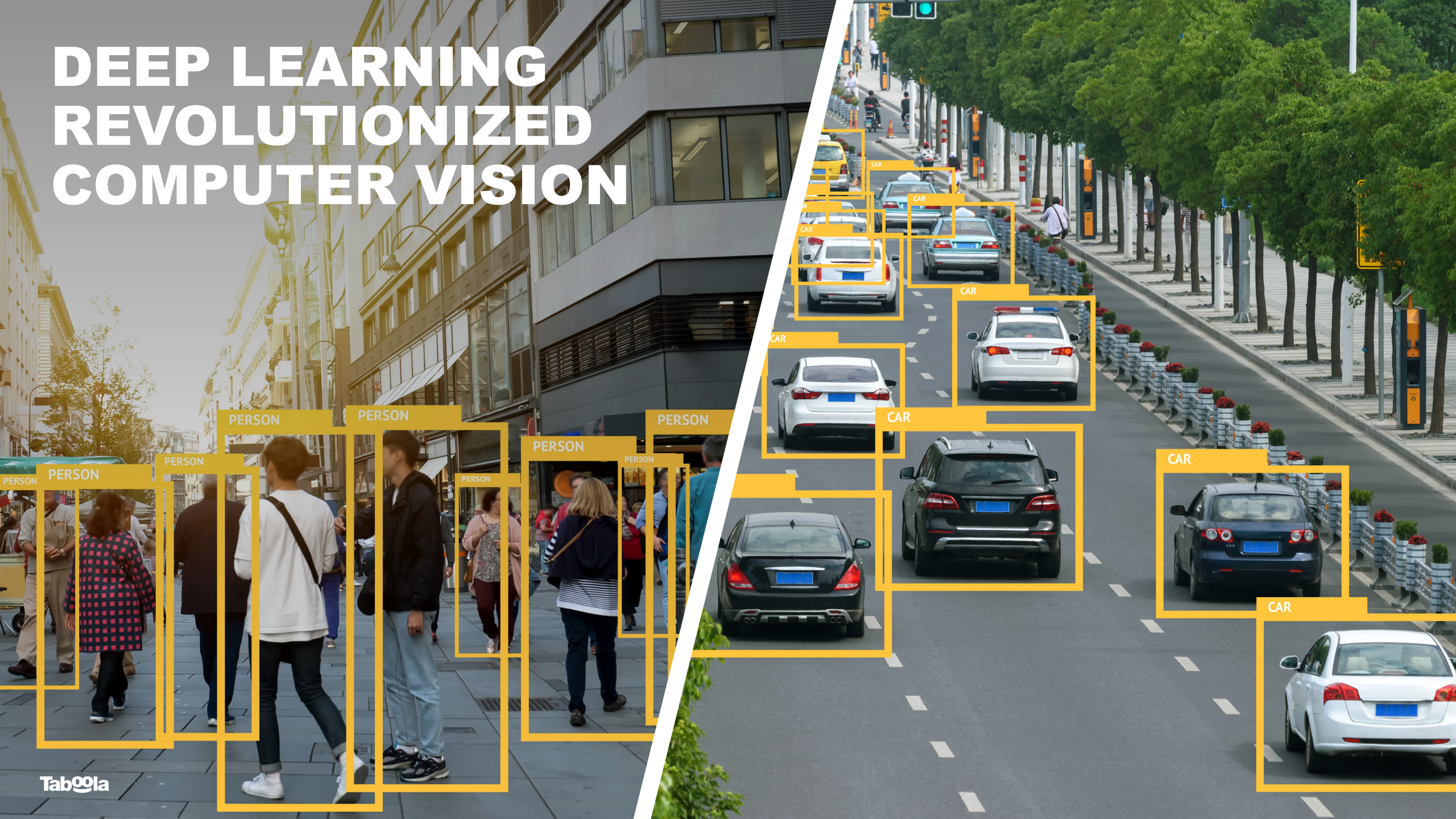
# WHAT DO PEOPLE ATTEMPT WITH AI?

Observe the world  
in a meaningful way

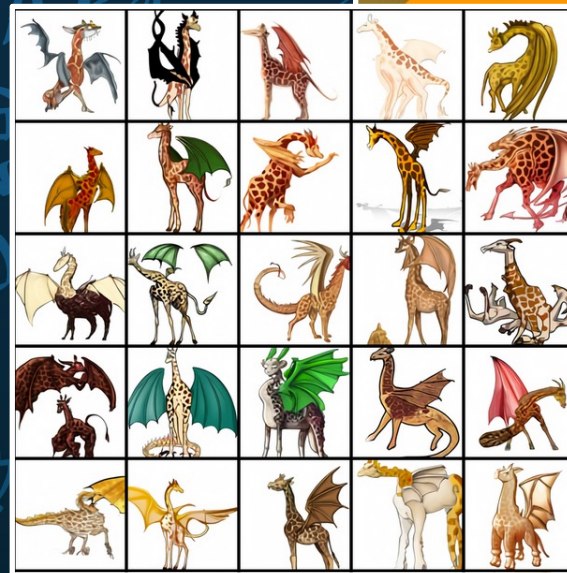
Learn new  
skills



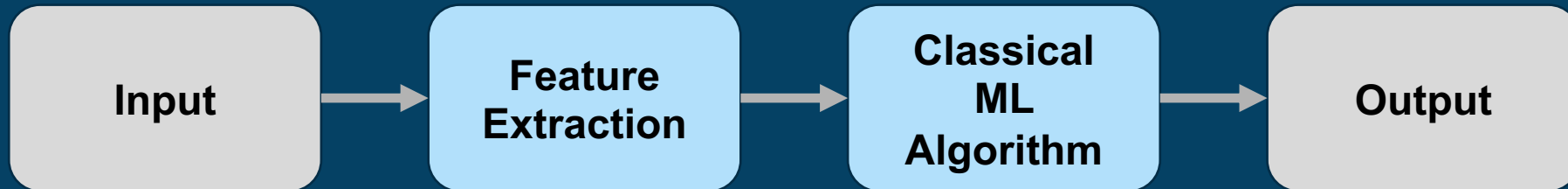
# DEEP LEARNING REVOLUTIONIZED COMPUTER VISION



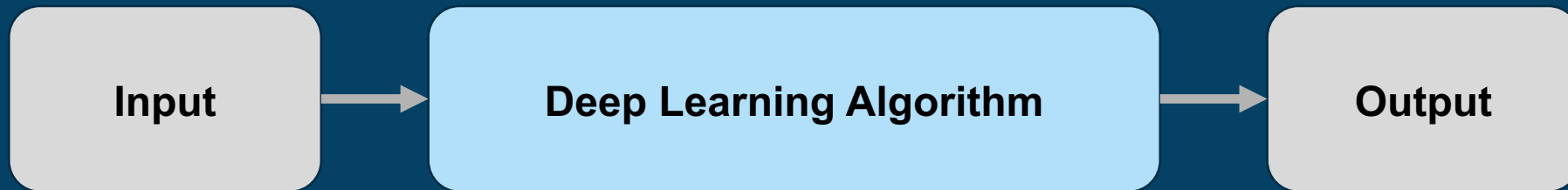
# DEEP LEARNING REVOLUTIONIZED NATURAL LANGUAGE PROCESSING



# “CLASSICAL” MACHINE LEARNING VS DEEP LEARNING

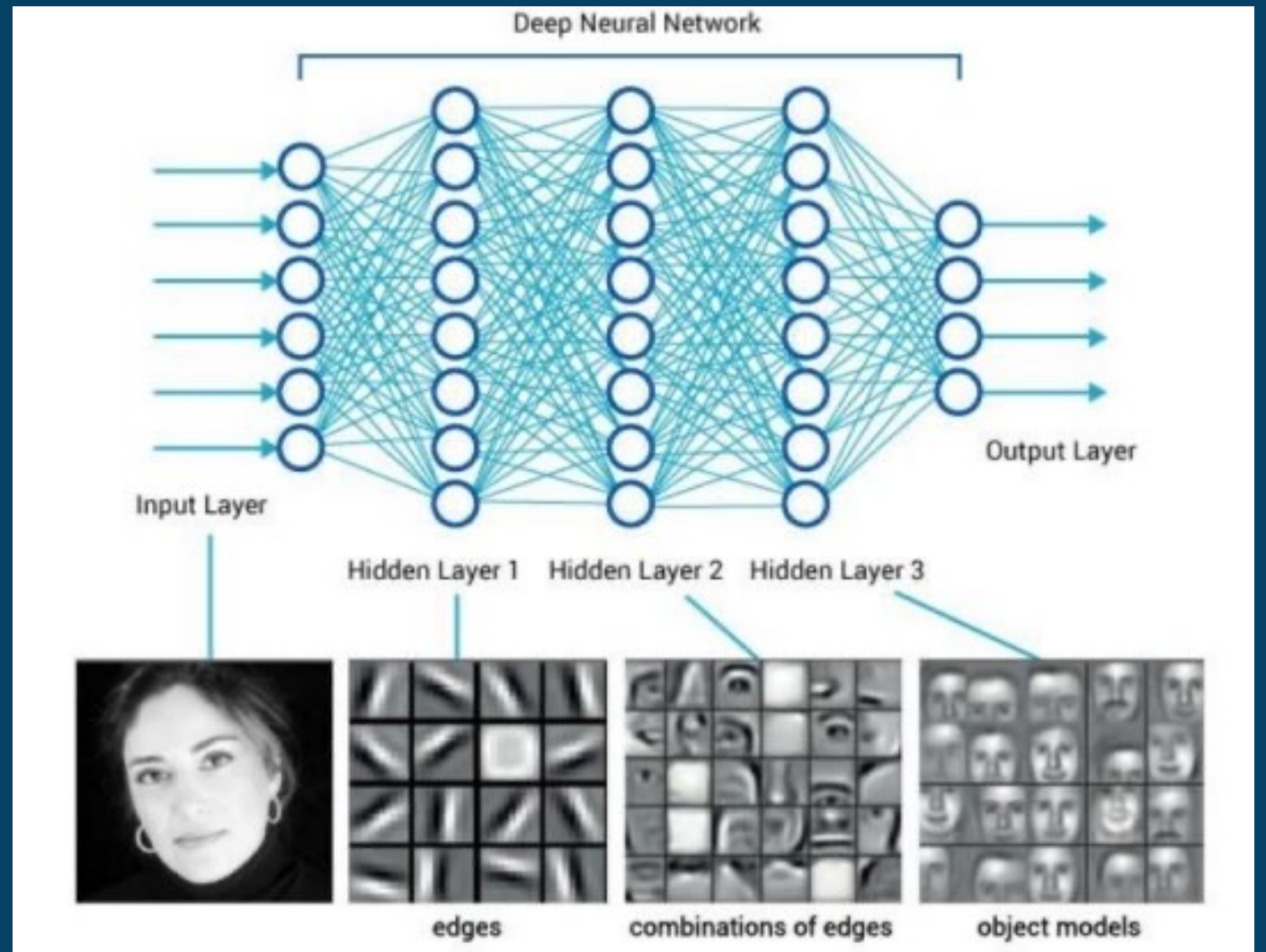


Classical Machine Learning Flow



Deep Learning Flow

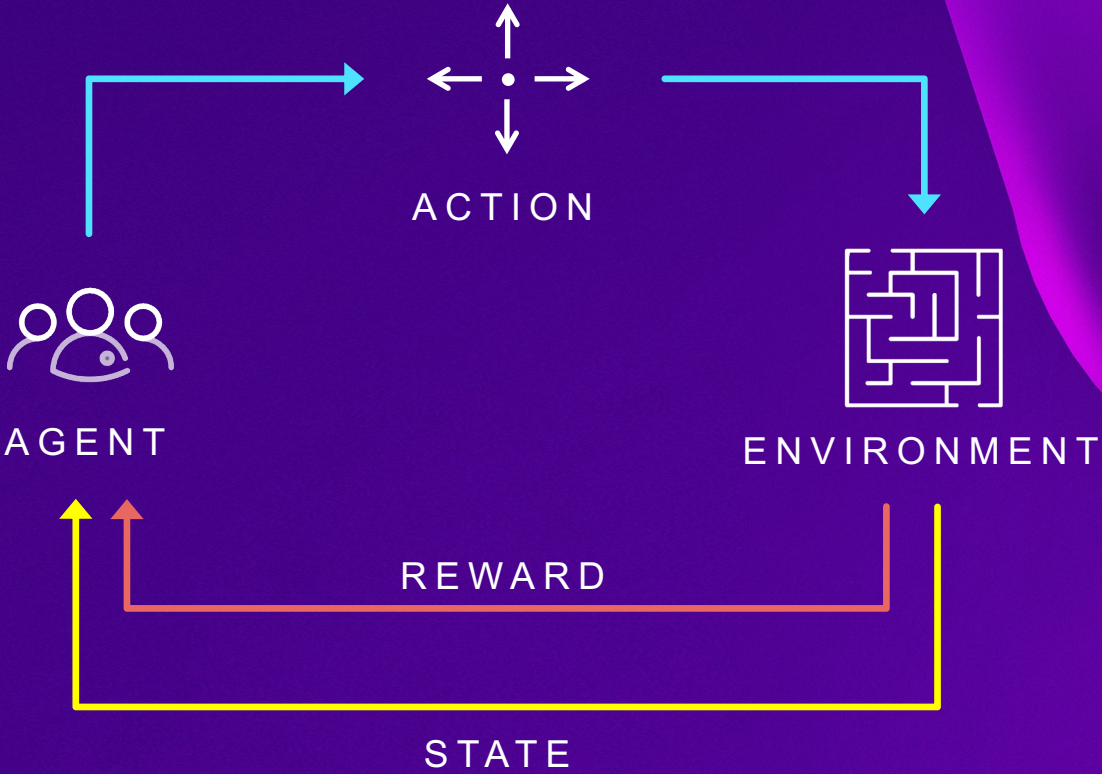
# “CLASSICAL” MACHINE LEARNING VS DEEP LEARNING



<https://www.saagie.com/blog/object-detection-part1/>



# AI THAT TEACHES ITSELF



## Explore

Unseen areas

## Exploit

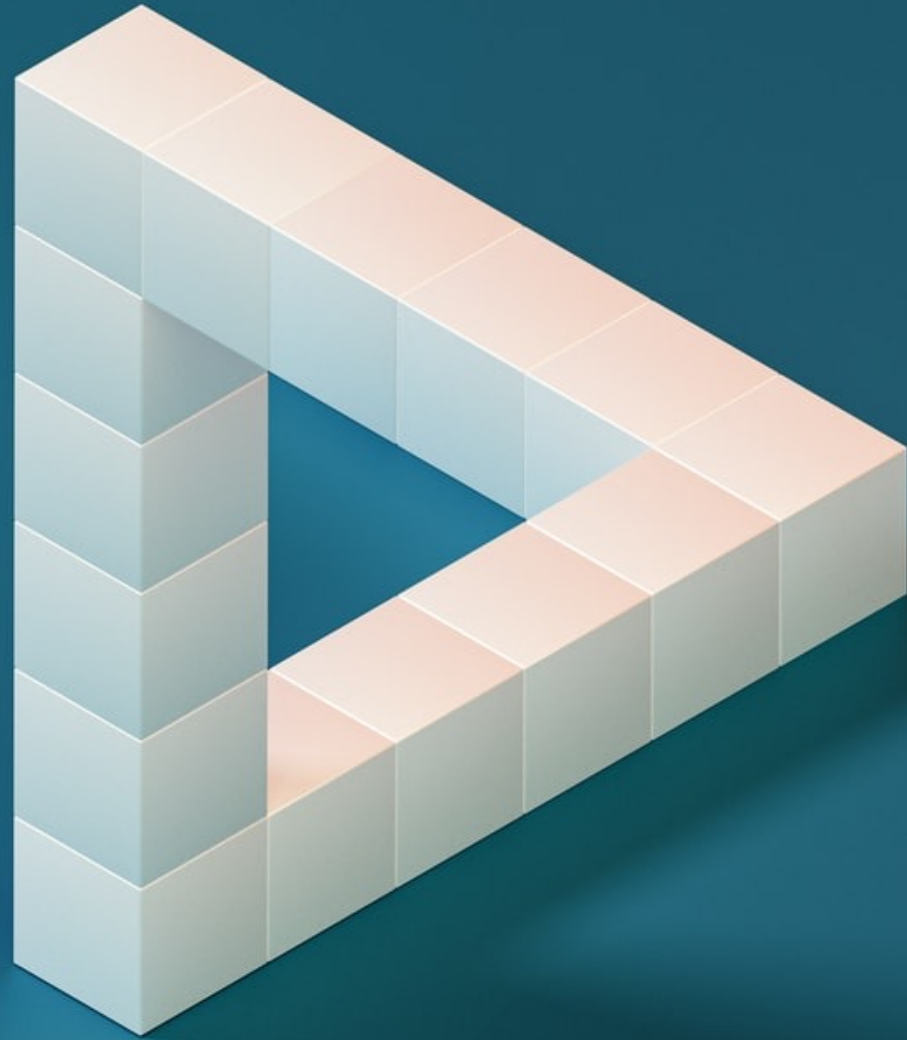
Previously learned insights

# AI THAT TEACHES ITSELF



# WHAT ARE WE TRYING TO SOLVE?

Matching millions of content items with over a billion people every month while optimizing publisher & advertiser success



**100TB+** Daily data

**200** Deep Learning Models Trained Daily

**500** R&D Team Members

**500K+** Requests per Sec

**50B+** Recommendations per day

**OUR SCALE**  
Is one of the main advantages of working with Taboola

**88%** US Mobile Internet Users Reached

**30M** Predictions Per Second

**7** Global Data Centers

**85** Deep Learning Scientists

**1.3B** Monthly Unique Users Globally

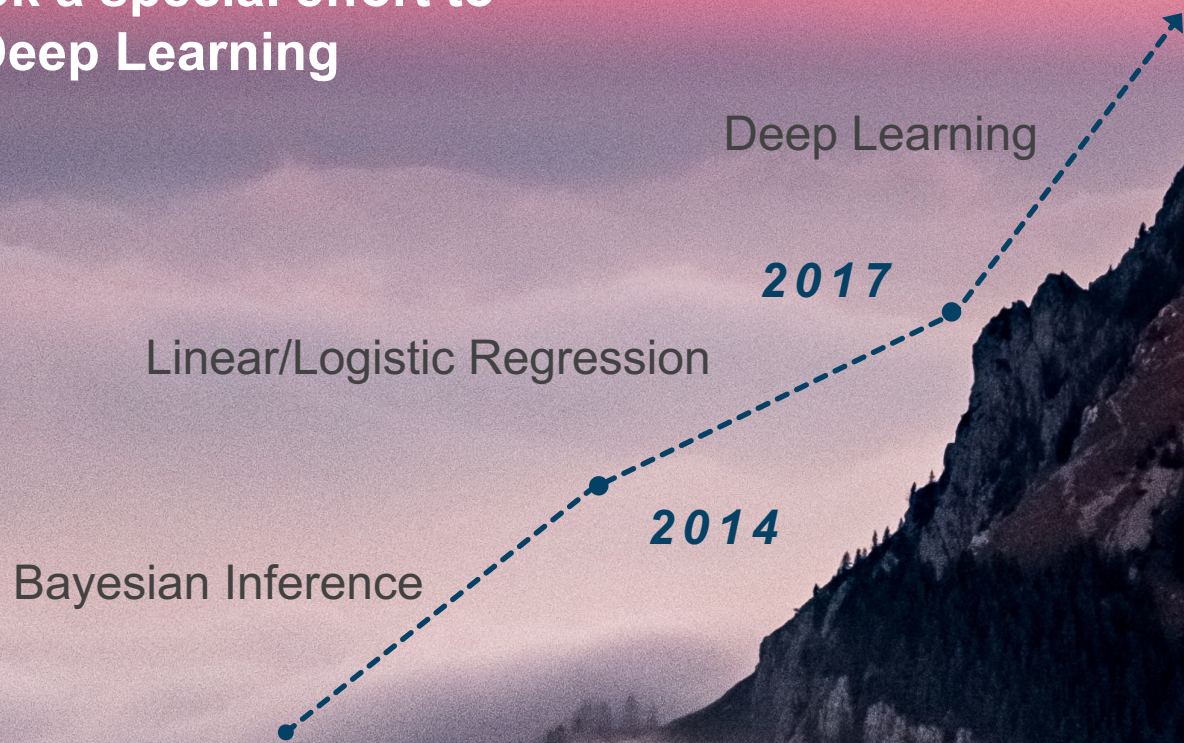
# TABOOLA'S AI DEPARTMENT

- 85 Research Engineers
- Research Engineer =  
Data Scientist + Software Engineer
- Analysis -> Modeling -> Experiments -> Production
- Pipeline is geared for continuous experimentation



# IT IS A JOURNEY...

And it took a special effort to get into Deep Learning



# THE IMPACT OF DEEP LEARNING ON TABoola'S CUSTOMERS

Dramatic improvement in RPM, CVR, CPA and organic recirculation\*

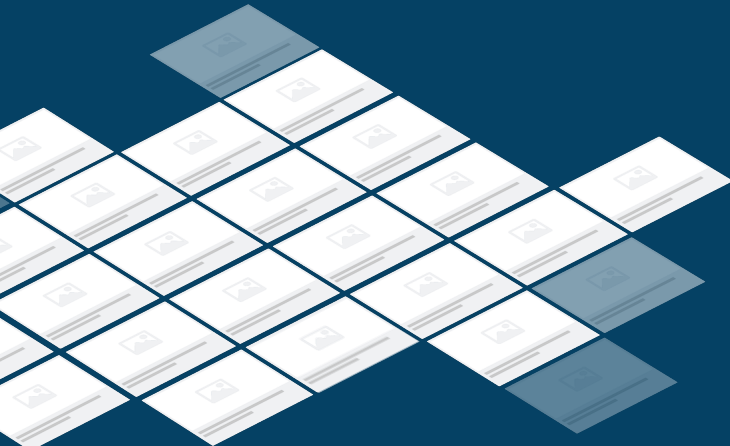
\* Tracked via long term a/b testing



# **WHERE DOES DEEP LEARNING FIT AT TABoola**



# WHAT ARE WE TRYING TO SOLVE?



Millions of Possible Recommendations



Rank N recommendations by *estimated CPM*



Sponsored Content

From Park Jogs to Marathon Training Here Are The Best Running Shoes  
Macy's

Sponsored

Don't Buy New Furniture Before You Visit This Site  
Wayfair | Sponsored



Context Metadata



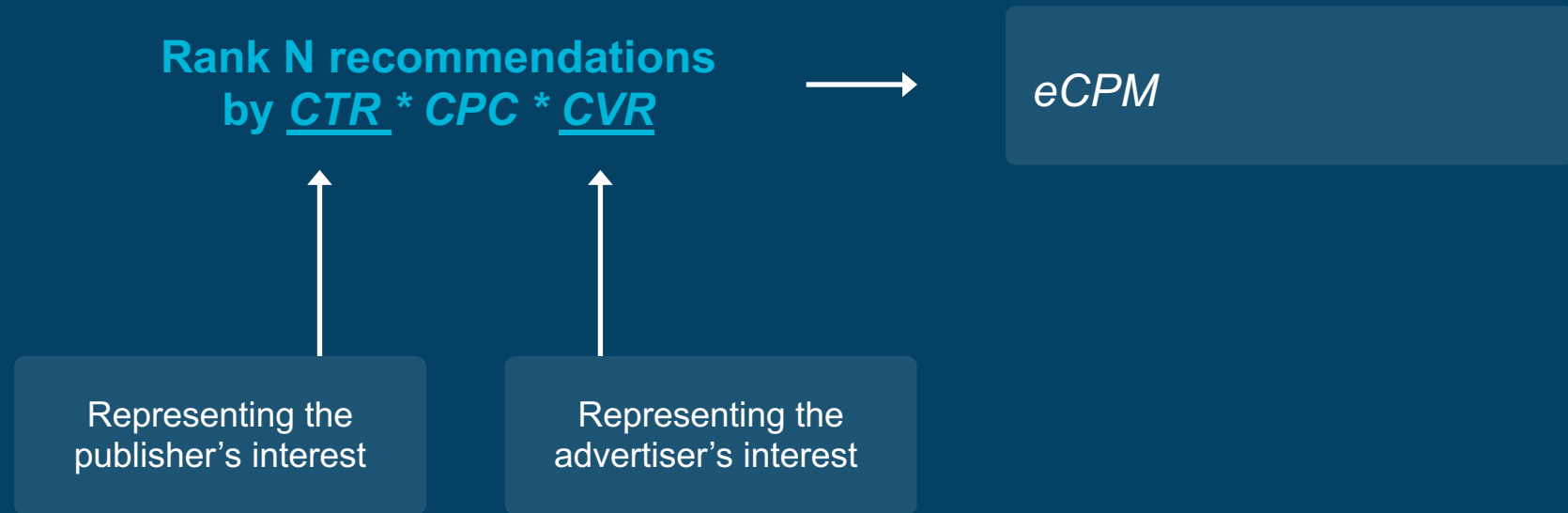
Location Region based Information



Curiosity Graph



# WHAT ARE WE TRYING TO SOLVE?

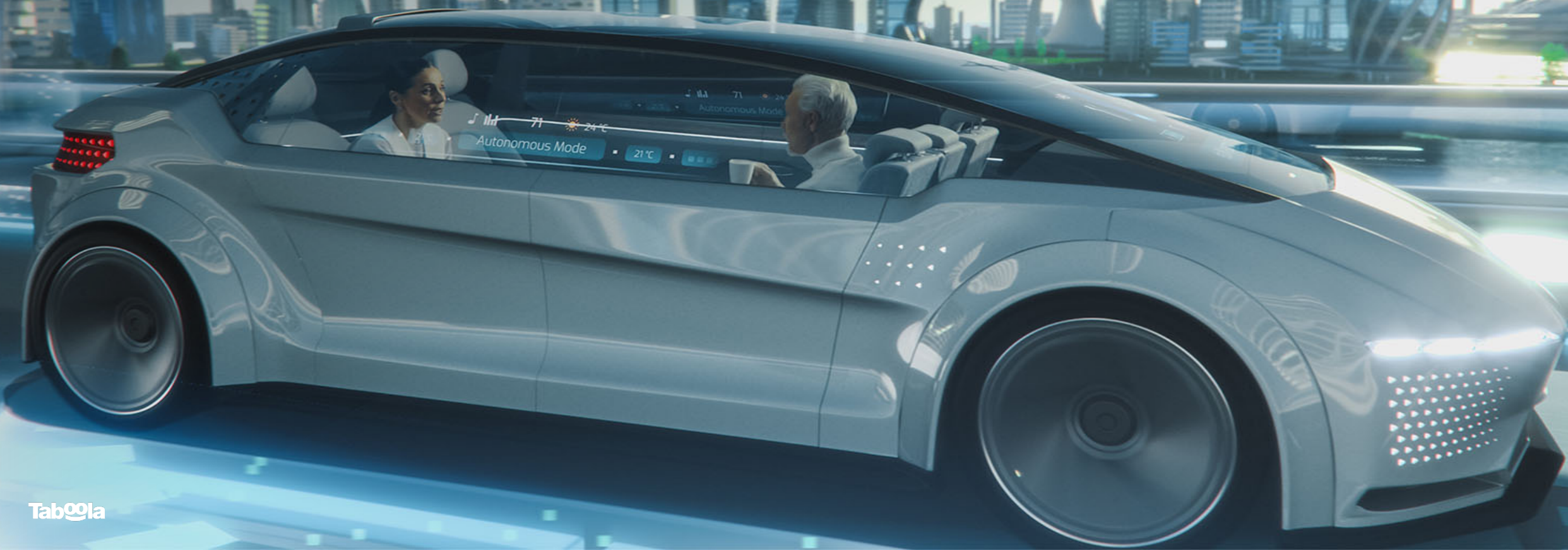


*CTR = Click Through Rate*

*CPC = Cost Per Click*

*CVR = Conversion Rate*

# SMARTBID AI - TABOOLA'S SELF DRIVING DISCOVERY PLATFORM



# WHAT DOES SMARTBID CAPTURE

*For users reading about COVID-19, SmartBid found that they have*



High tendency to engage  
with travel campaigns  
35% Higher Ranking Score  
CPA down 40%



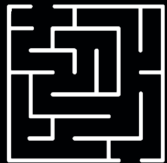
Lower tendency to engage  
with personal investing  
campaigns:  
40% Lower Ranking Score  
(CPA would be up 50%)

# HOW DOES SMARTBID GET SMARTER ON ITS OWN

It actively seeks new knowledge

## EXPLOIT

I'm fairly certain I know what to do



Environment



## EXPLORE

I need to learn more about this



Autonomous  
Driving tool

# WHAT DOES SMARTBID CAPTURE

*For users reading about Sports, SmartBid found that they have*



Not so much into books and literature campaigns  
45% Lower Ranking Score  
(CPA would be up 25%)

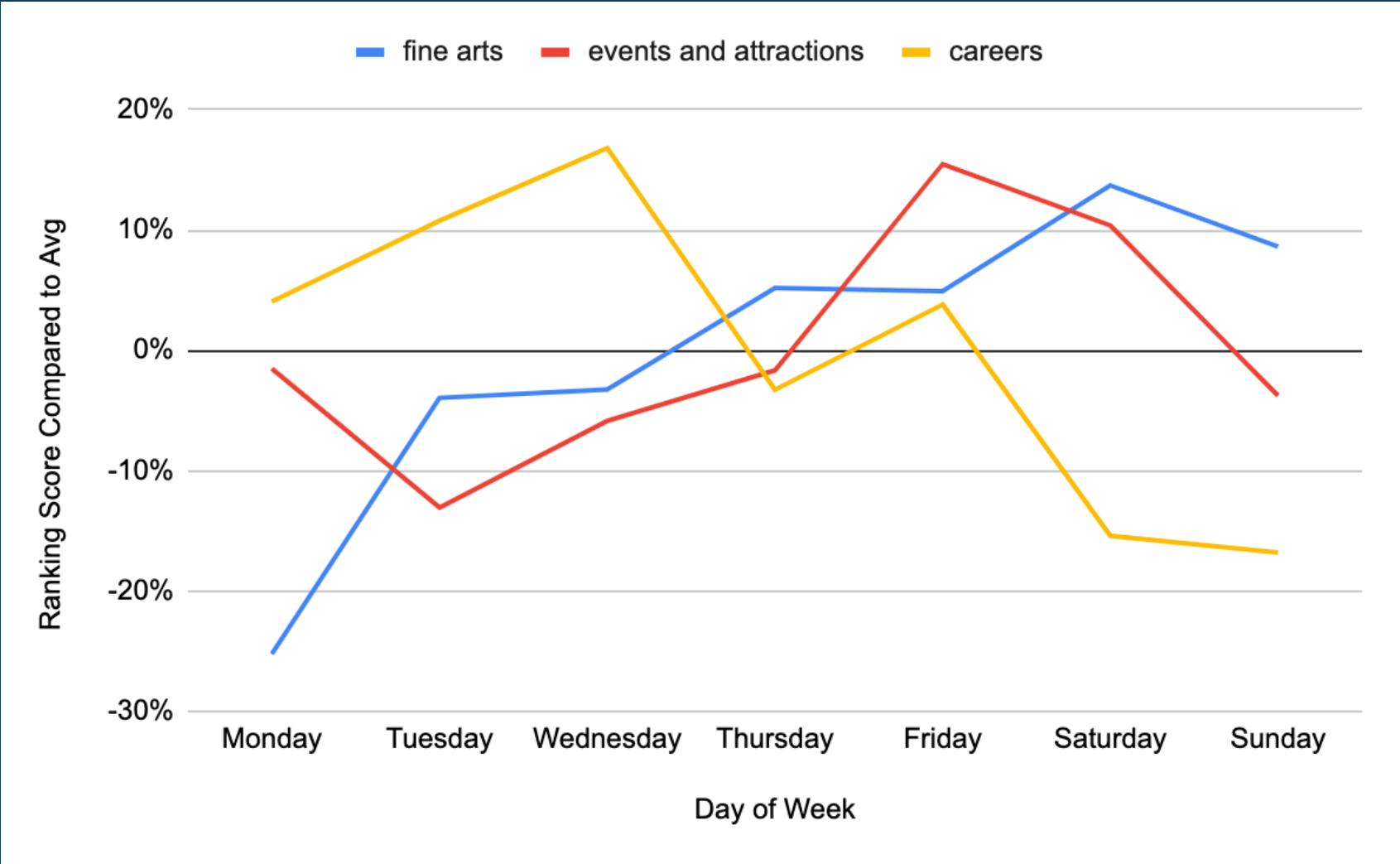


Much more into “lighter” subjects like other hobbies and interests:  
25% Higher Ranking Score  
CPA down 60%



# WHAT DOES SMARTBID CAPTURE

Trends throughout the week



# WHAT DOES SMARTBID CAPTURE

*SmartBid knows that users reading tech are more likely to engage with finance ads.  
But more specifically...*

For users reading articles  
about this

SmartBid: stock  
investing ads will  
perform exceptionally  
well in this context.

Ranking Score x15 compared to  
how it ranks on an average article;  
x3 compared to other tech articles

## Amazon announces 20-to-1 stock split

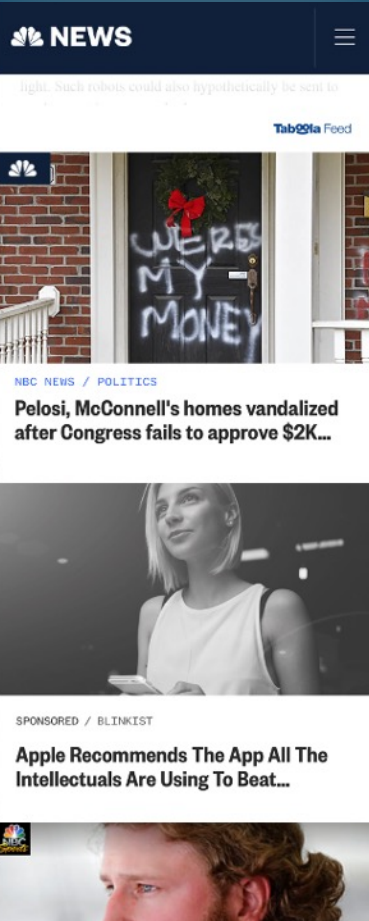




# UNDER THE HOOD

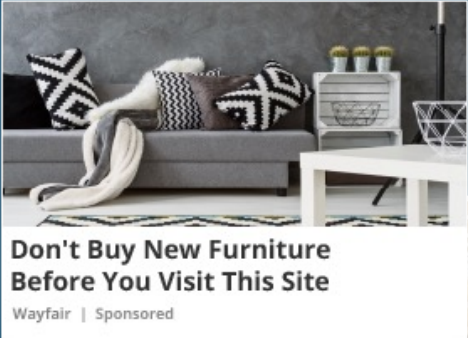


# WE SOLVE MULTIPLE PROBLEMS USING THE SAME PLATFORM



## PUBLISHERS

Revenue;  
Subscription;  
View per session



## ADVERTISERS

CPA/ROAS;  
Conversions@scale



## OEMs

User Engagement  
& Retention





# SOME THINGS WE ARE WORKING ON?

- Contextual intent at higher scale
- Faster way to explore new matching patterns
- Models which allow scaling more diverse types of advertisers
- Model lifetime value and increased engagement over time
- Smarter Bidding on any supply



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