



Engaging Content  
Engaging People

UbiTtention  
2020



A World  
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For what's next

# Enticing Notification Text & the Impact on Engagement

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9. Limitations & Future Work
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Engaging Content  
Engaging People

# Introduction



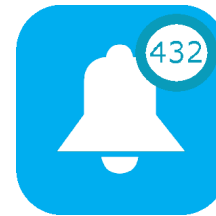
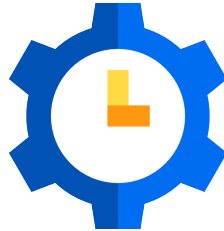


Growing number of notifications **pushed** at users (Pielot, M. et al, 2014).



Notification delivery **not smart** (Mehrotra, A. et al, 2016).

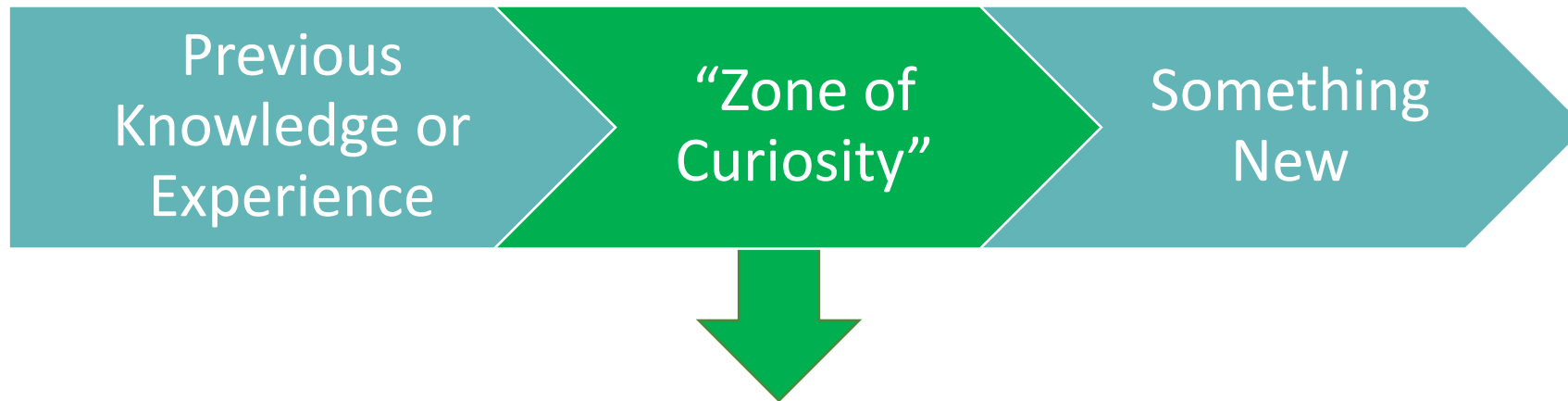
Unnecessary notifications may **dramatically decrease** productivity (Iqbal, S. T. et al, 2010).



Large no. of incoming notifications = **negative user emotions** (Sahami Shirazi, A. et al, 2014).



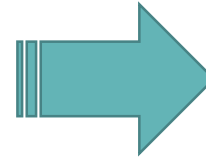
“Curiosity happens when we feel a gap in our knowledge” - Loewenstein



Curiosity peaks when a small amount of information is revealed, but key parts are withheld



John Caples, 1926



## 17 Facts You Won't Believe Are True

Hope you're sitting down for this one.

 **Jessica Misener**  
posted on Oct 24, 2014



## 42 Wrestlers You Won't Believe Actually Existed

#NeverForget

 **Nick Wray**  
posted on Nov 07, 2014



## Why BuzzFeed Doesn't Do Clickbait

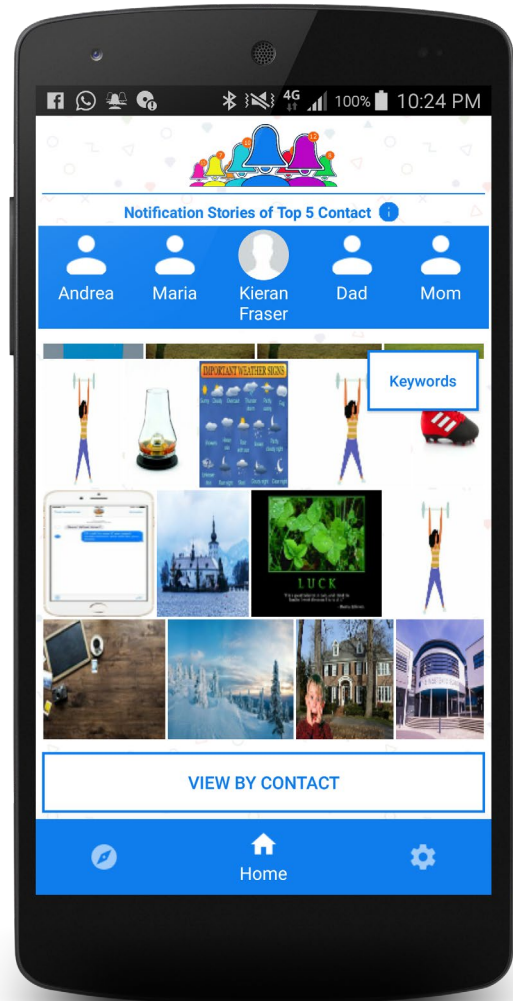
You won't believe this one weird trick.

 **Ben Smith**  
posted on Nov 06, 2014

WordStream, 2017



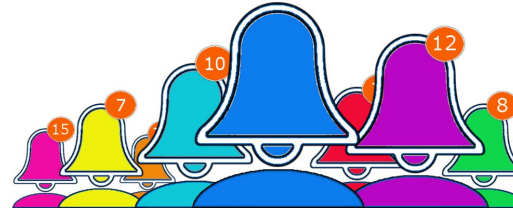
# Capturing Mobile Push-notifications



## WeAreUs Android App

- ❖ Experience Sampling Method
- ❖ Moments of notification interest, moments of phone usage interest
- ❖ Privacy-preserving text feature

# Capturing Mobile Push-notifications



**18 participants**  
over **3 months**

**35,314**  
notifications  
logged

**309**  
questionnaire  
responses

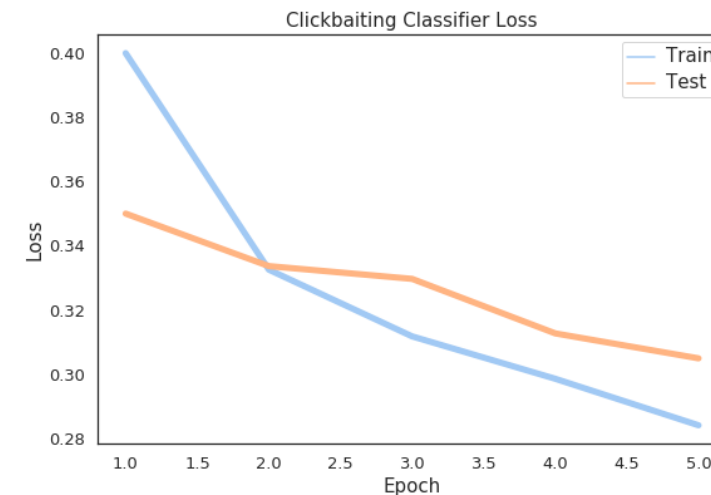
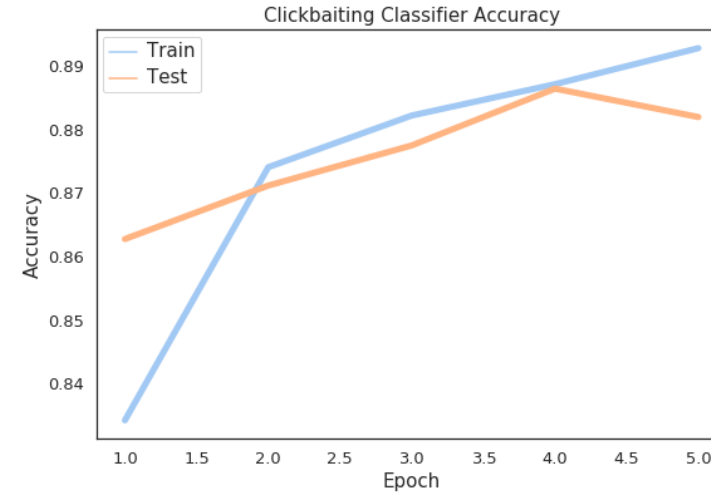
**7,123**  
smartphone  
usage logs



# Enticing Push-notifications



Clickbait	Text
Yes	19 Hilarious Jokes About Being An Intellectual That Will Make You..
Yes	Business Schools That Will Dominate In The 21st Century..
No	Coldplay's new album hits stores worldwide this week
No	James Harden is Our NBA MVP at the All-Star Break..

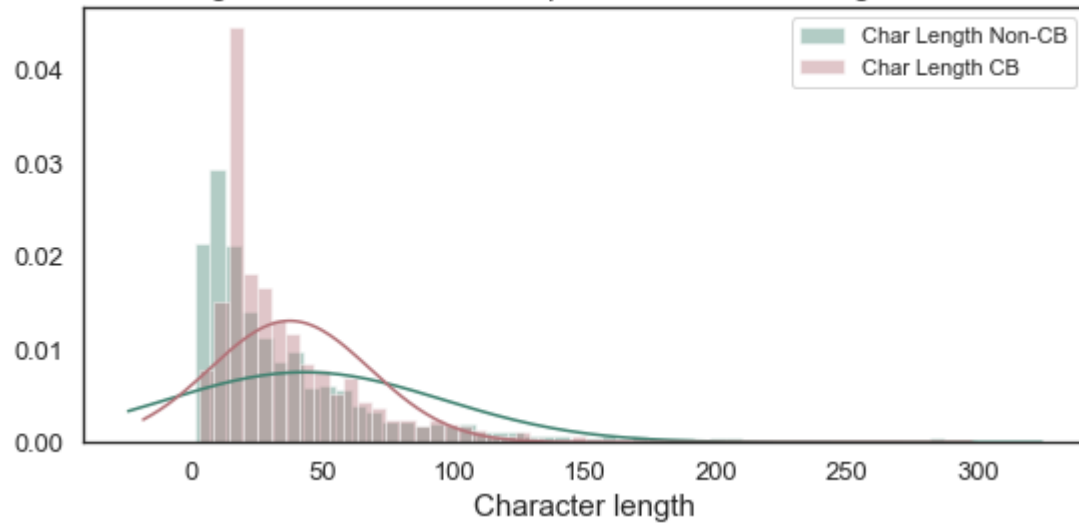




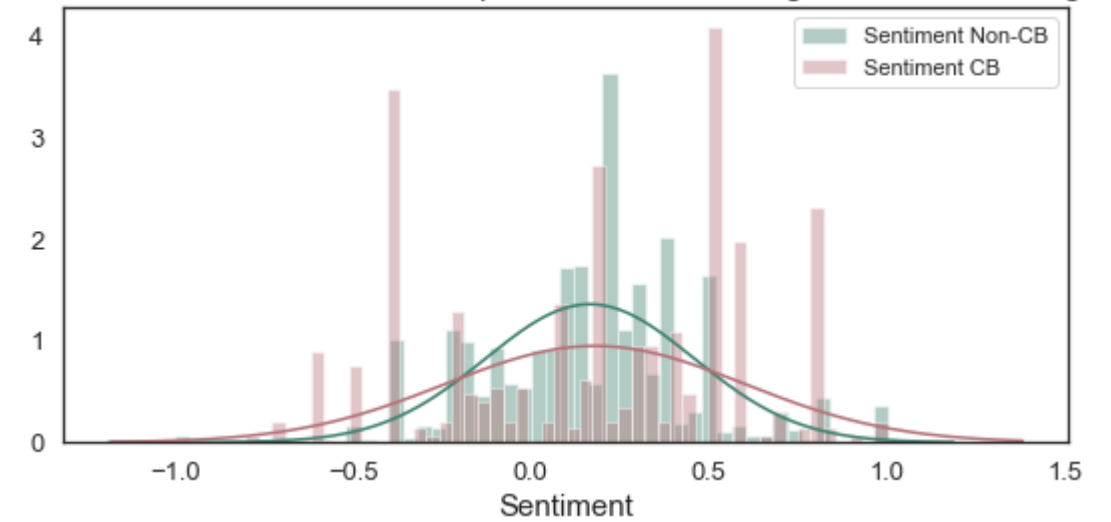
# Enticing Push-notifications



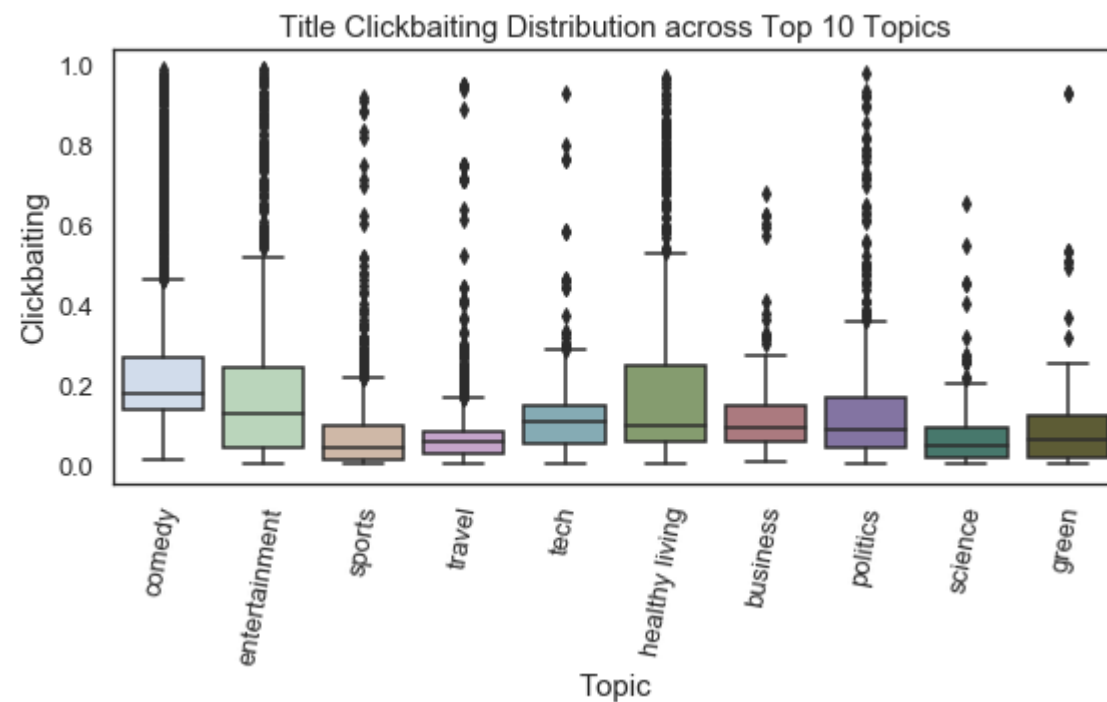
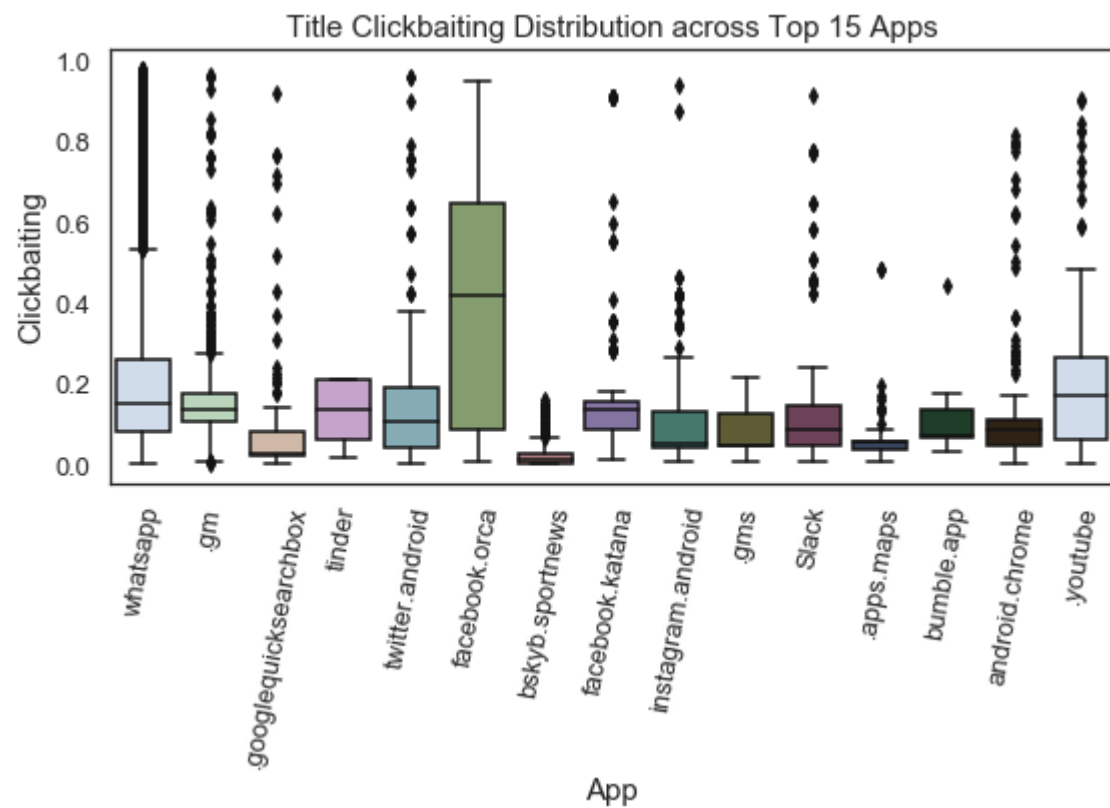
Character Length Distribution of Titles split between Clickbaiting and Non-clickbaiting



Sentiment Distribution of Titles split between Clickbaiting and Non-clickbaiting



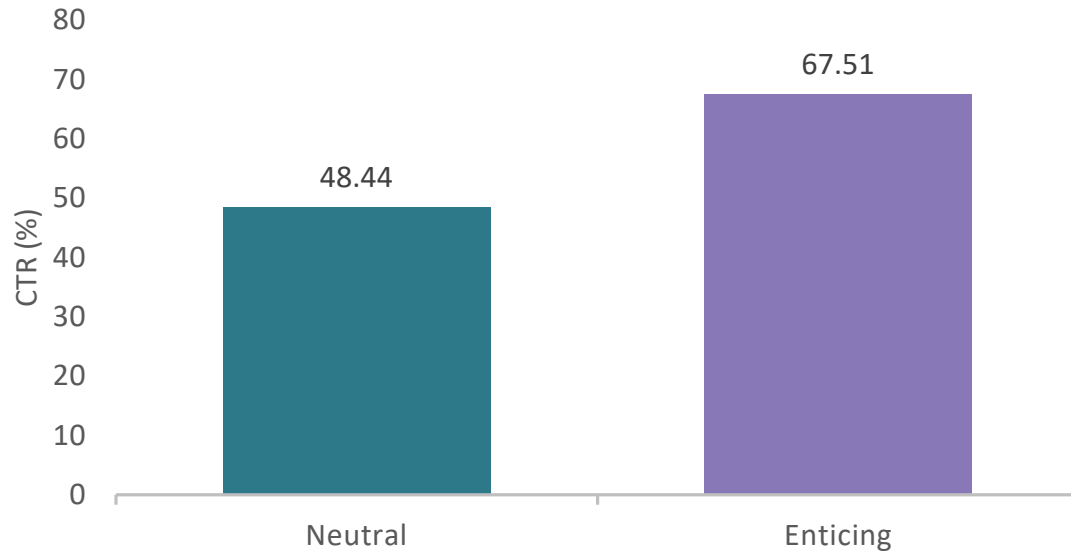
# Enticing Push-notifications



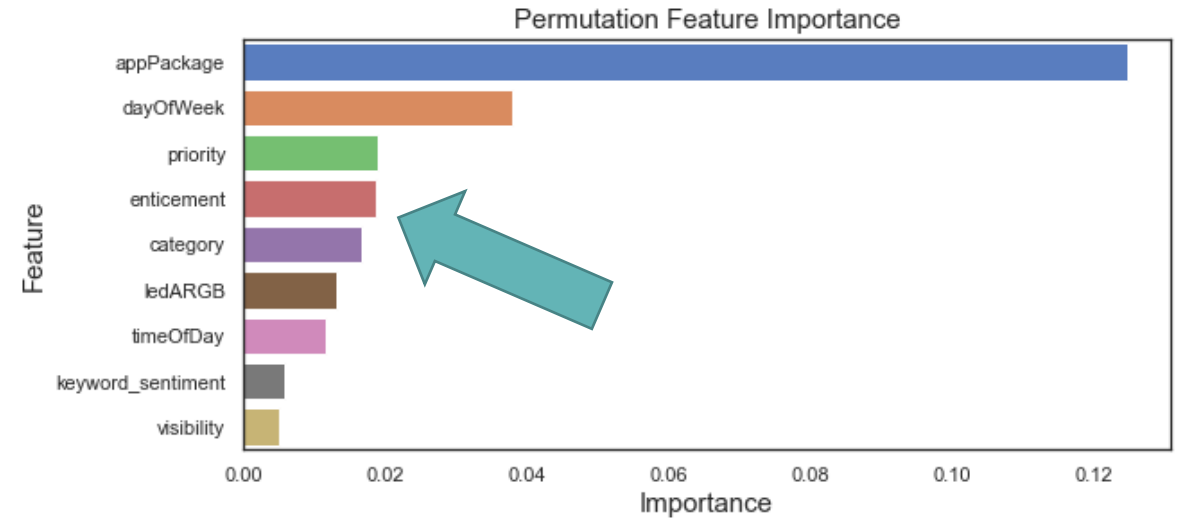
# Enticing Push-notifications



Enticing Vs Neutral Notification  
Click-Through Rate



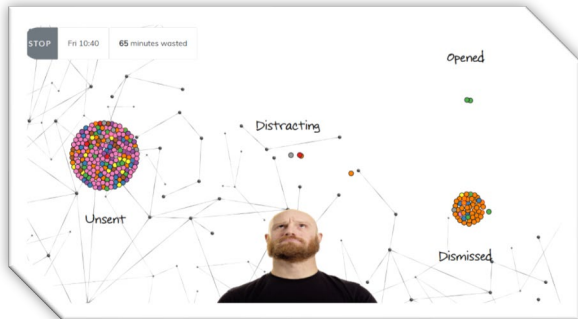
Exact Sign Test:  $p = .012$





## OpenAI Gym

Open source toolkit for “developing and comparing reinforcement learning algorithms” <sup>1</sup>

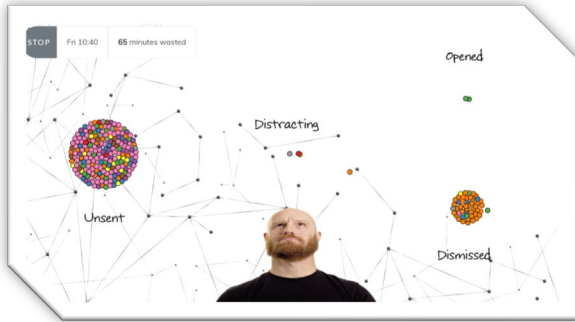


## Gym-Push

Custom *OpenAI* Gym environment simulating push-notification overload on mobile device users

1. <https://gym.openai.com/>





## Gym-Push

Custom *OpenAI* Gym environment  
simulating push-notification overload  
on mobile device users

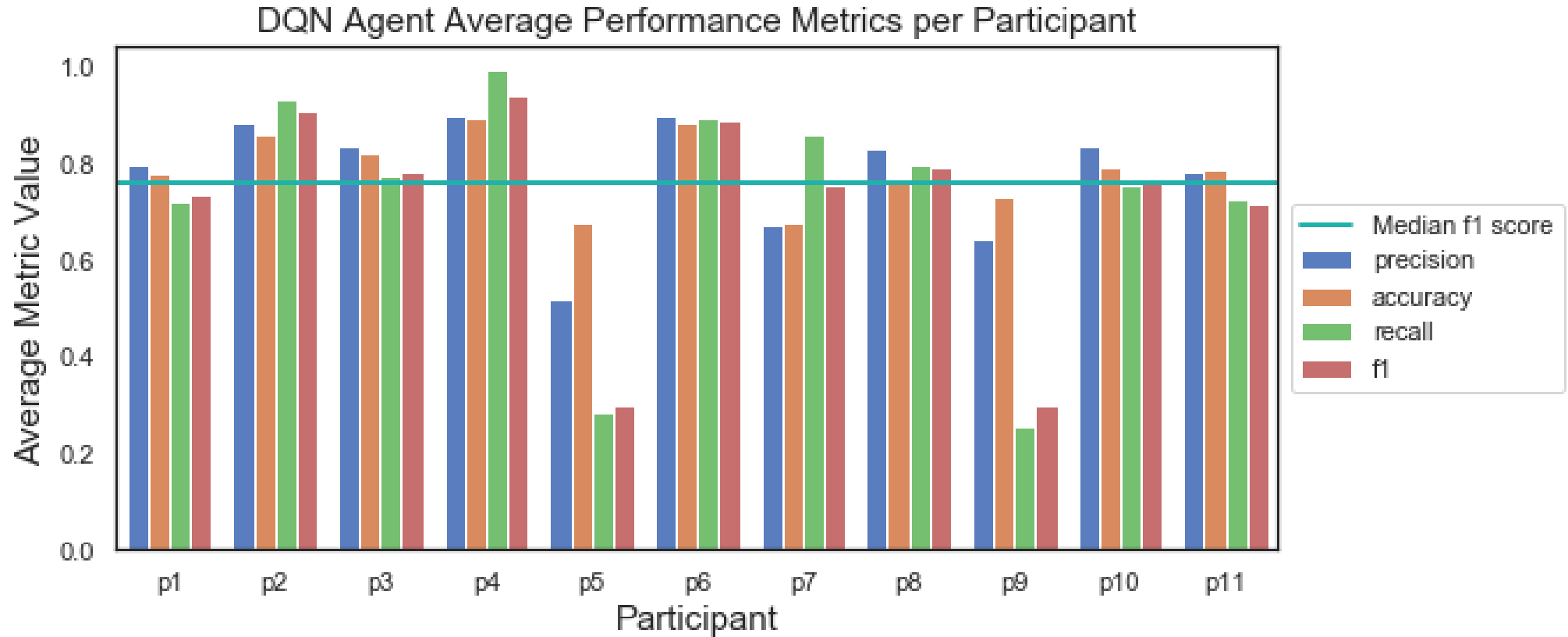
### State

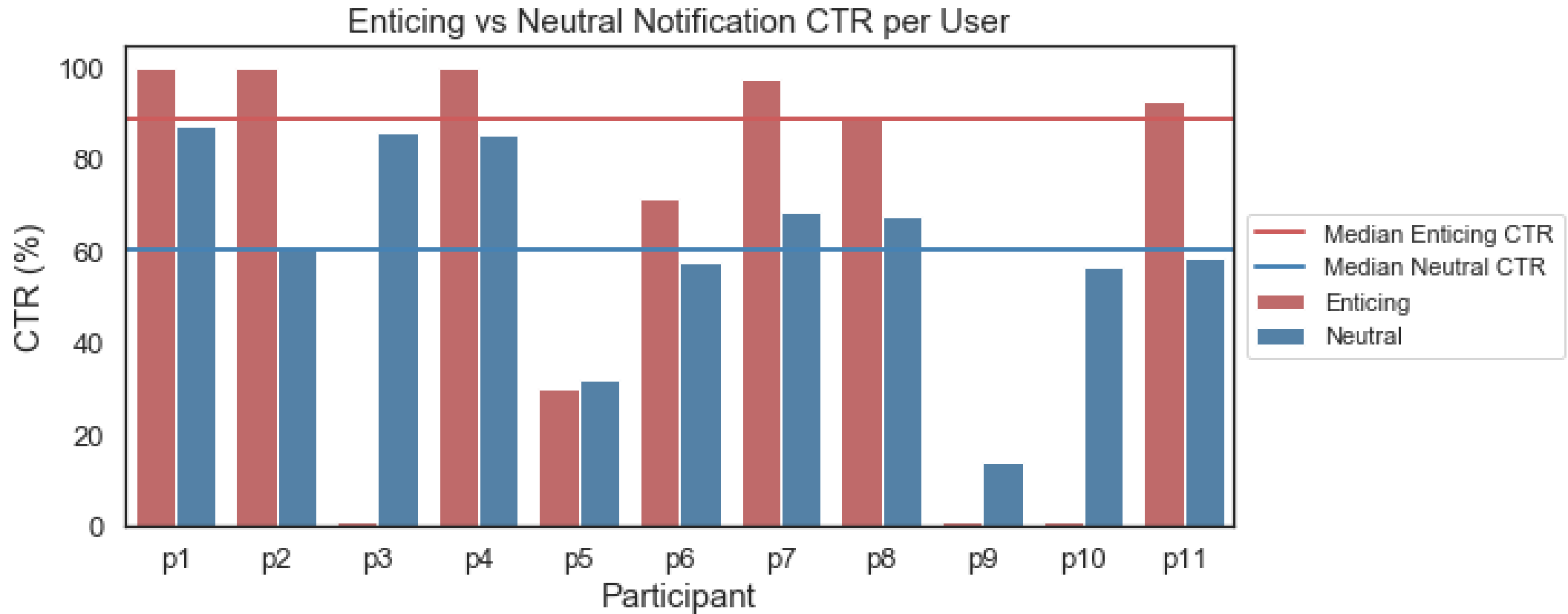
Privacy-preserving  
Text Embedding

### Action

Open / Dismiss  
the notification









**Alerts**  
Monitor the web for interesting new content

← Technology July 15, 2020 < >

NEWS

**Title** → Google Maps now using Live View AR to calibrate your location: All you should know  
Times Now

**Content** → Almost after a year of rolling out AR walking directions for Android and iOS users, Google Maps, betting big on augmented reality and now using Live View to calibrate the location of its users. According to the search engine giant, internet and GPS can fall ...

The best music hacks for the Amazon Echo  
Digital Trends

Speakers like the Amazon Echo Plus or the top-tier Echo Studio can unleash your favorite tunes with room-filling sound. An Echo is great for parties, house-cleaning sessions, cooking, or just setting some relaxing mood music (add a smart display, and even ...

What Huawei's 5G UK network ban means for you  
TechRadar

As the world slowly builds up its 5G infrastructure, and looks forward to faster mobile connectivity than ever before, Britain has made a curious decision: it has decided to switch some of the 5G equipment off again. Why? Because some of what has already ...

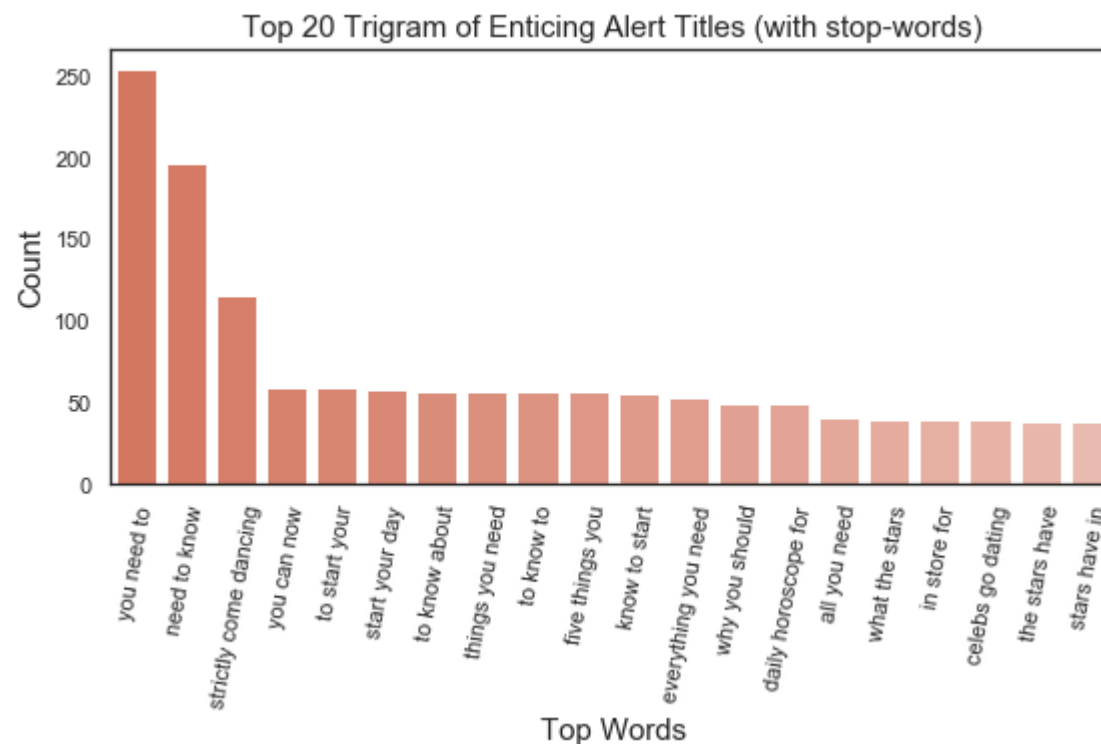
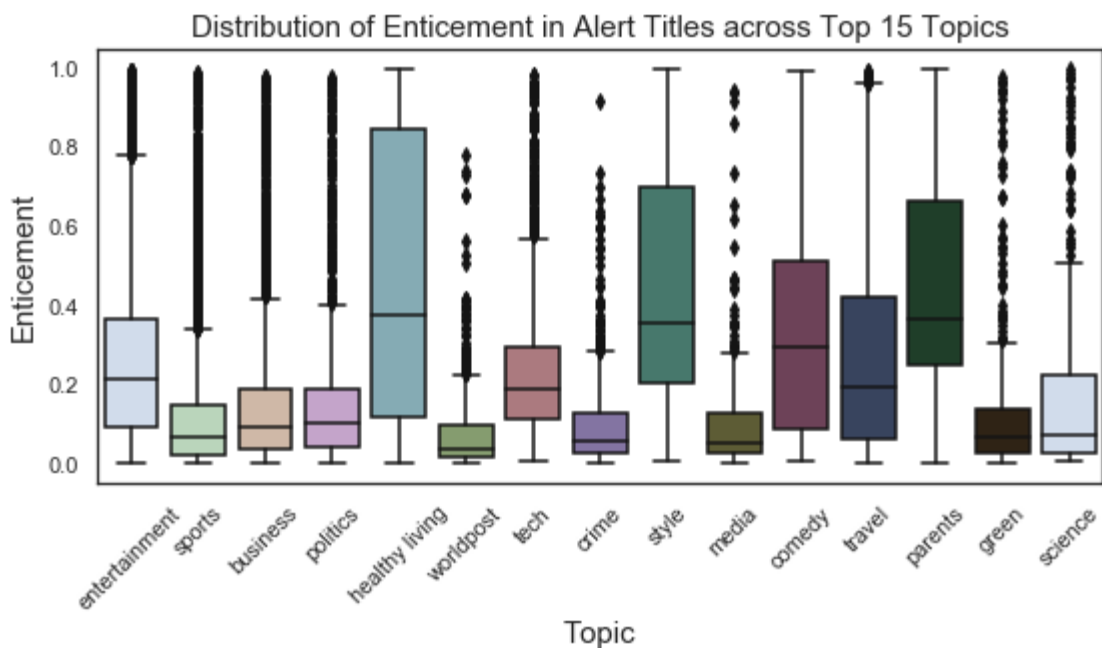
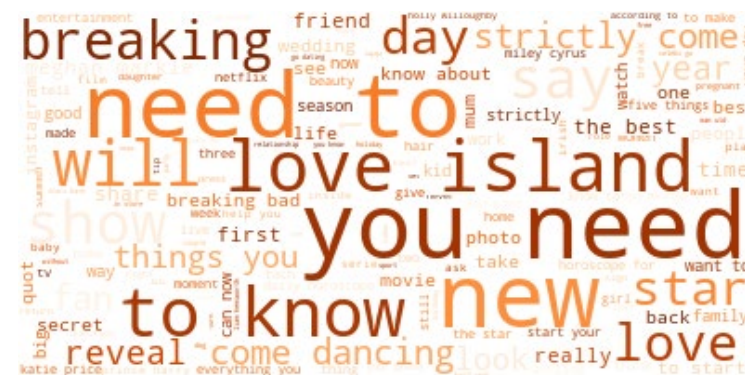
## Subscribed Topics:

- Breaking
- Entertainment
- Health
- Beauty
- Style
- Science
- Sport
- Tech
- World

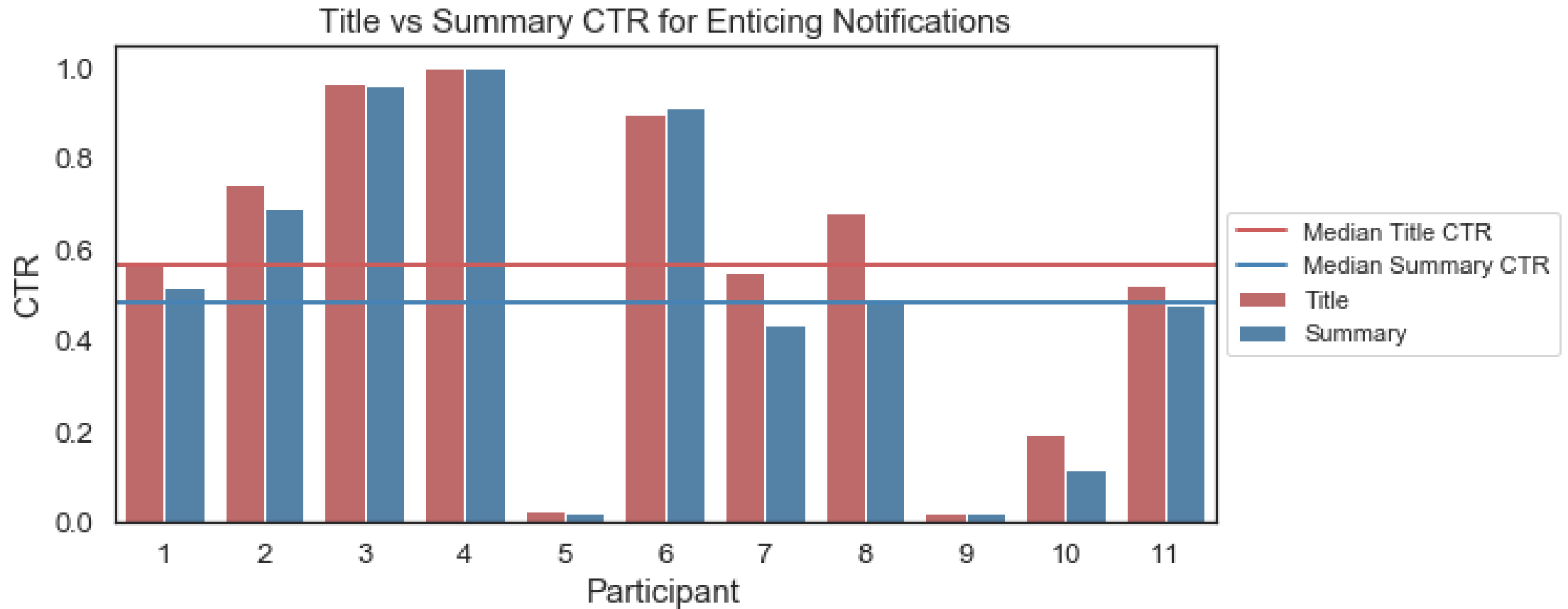
# Capturing Web Push-notifications



Clickbait	Text
Yes	Most important 2019 game for every ACC football team
Yes	You've Never Seen Skateparks Like This Before
Yes	Are You Moisturizing Your Skin Correctly?
No	UK must decide next step on Brexit, says France's Europe minister
No	The Killers to headline Glastonbury's Pyramid Stage on Saturday
No	Clare Under 20 Football Team Announced To Face Waterford



# Enticing Titles vs Summaries





## Limitations

- Granularity of notification text in WeAreUs study
- Lack of engagement action in Google Alert data set
- Enticing but useful, distinguishing nuance
- Offline simulations

## Future Work

- Larger online in-the-wild study
- Link toward inherent participant traits e.g. curiosity or personality
- How can we train intelligent systems to be better than us



- Click-through Rate larger for notifications with enticing text
- Enticement is an important feature for predicting subscriber engagement action
- Summarisation has potential to reduce the influence of enticing notification text

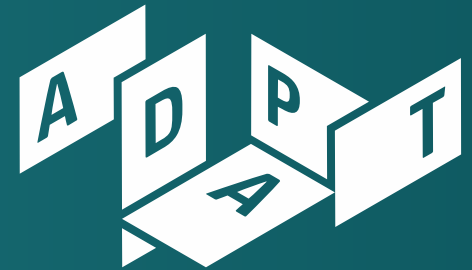
This research is supported by the ADAPT Centre for Digital Content Technology under the SFI Research Centre Program (Grant 13/RC/2106) and is co-funded under the European Regional Development Fund.



# Thank you!

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[www.adaptcentre.ie](http://www.adaptcentre.ie)



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