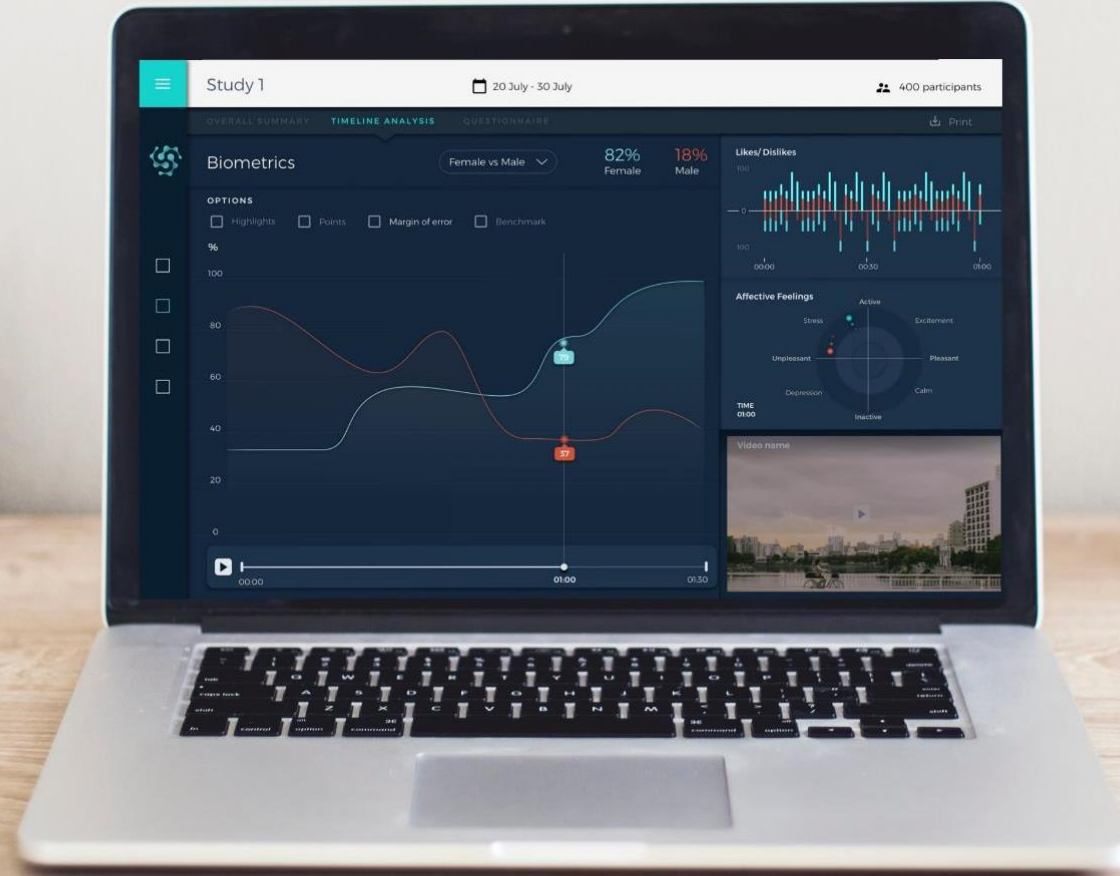


Automated collection of biometrics at scale



Pedro Almeida, PhD

Where we come from...



Pedro Almeida

CEO

PhD Cog Neuroscience
Professor @ U Porto – Research
Methods, Biosocial Psychology,
Psychophysiology



Nuno Dias

CTO

PhD Cog Bio Engineering
Professor @ IPCA, U Minho – Electronics and
instrumentation, Programming, Machine
Learning



Pedro Chaves

Head of Research

PhD St Exp Neuroscience
Researcher @ U. Minho, Ottawa
Lecturer iPiaget – Neuroscience,
Psychophysiology

Measuring emotion is (really) hard





DECLARATIVE



FACIAL CODING



BIOMETRICS



CNS ACTIVITY

Speed & Scale

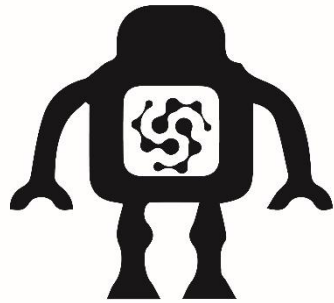
Reliability





x 000...’s

+



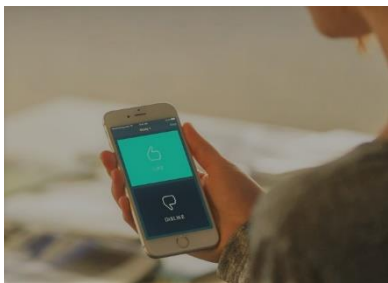
AUTOMATION



DiY

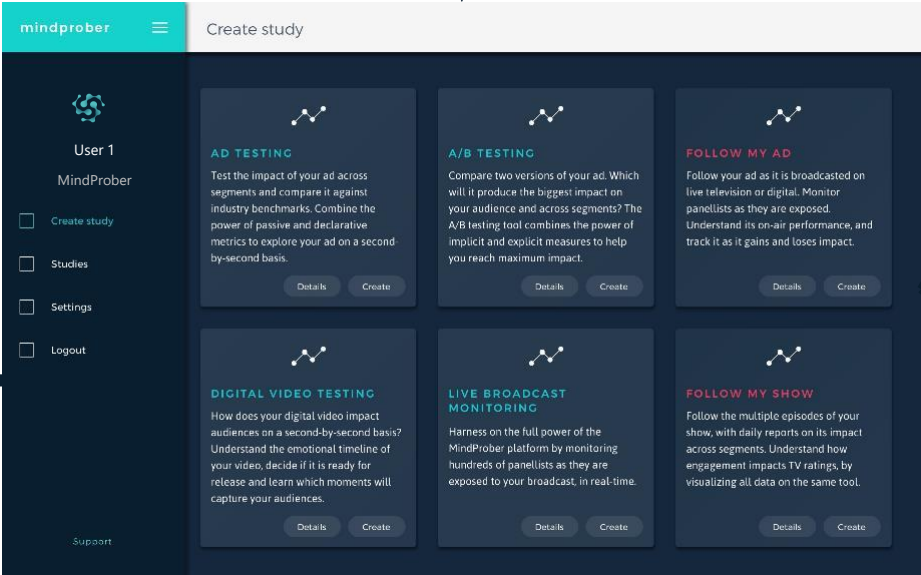
3

COLLECT DECLARATIVE & PHYSIOLOGICAL FEEDBACK



2

DISTRIBUTE INSTRUCTIONS AND CONTENT



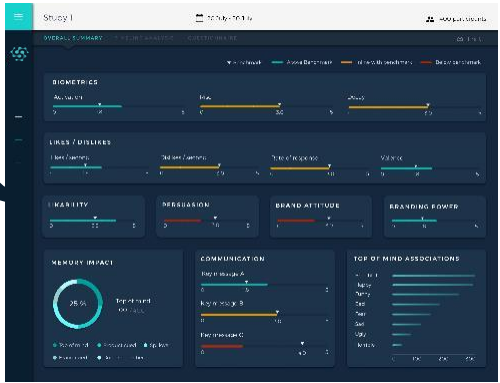
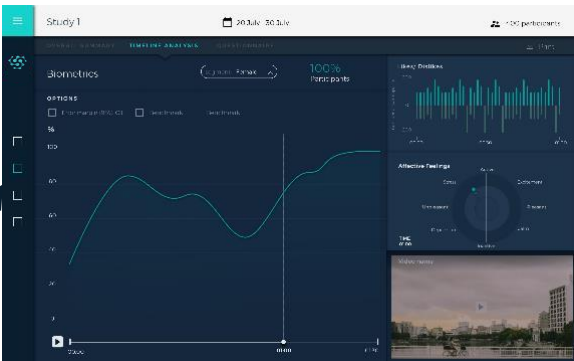
1

STUDY SETUP



4

METRICS AND REAL-TIME REPORT



BENCHMARK & LEARNING

Does it work?



3 (scientific) challenges

The signals collected
by the sensor are
equal or better than
those collected by a
lab polygraph

Our platform is able
to discriminate
relevant events

Our metrics provide
meaningful and
impactful analysis at
business level



Challenge #1

Signals are the same or better

Able to discriminate relevant events

Have a real impact for business

Is



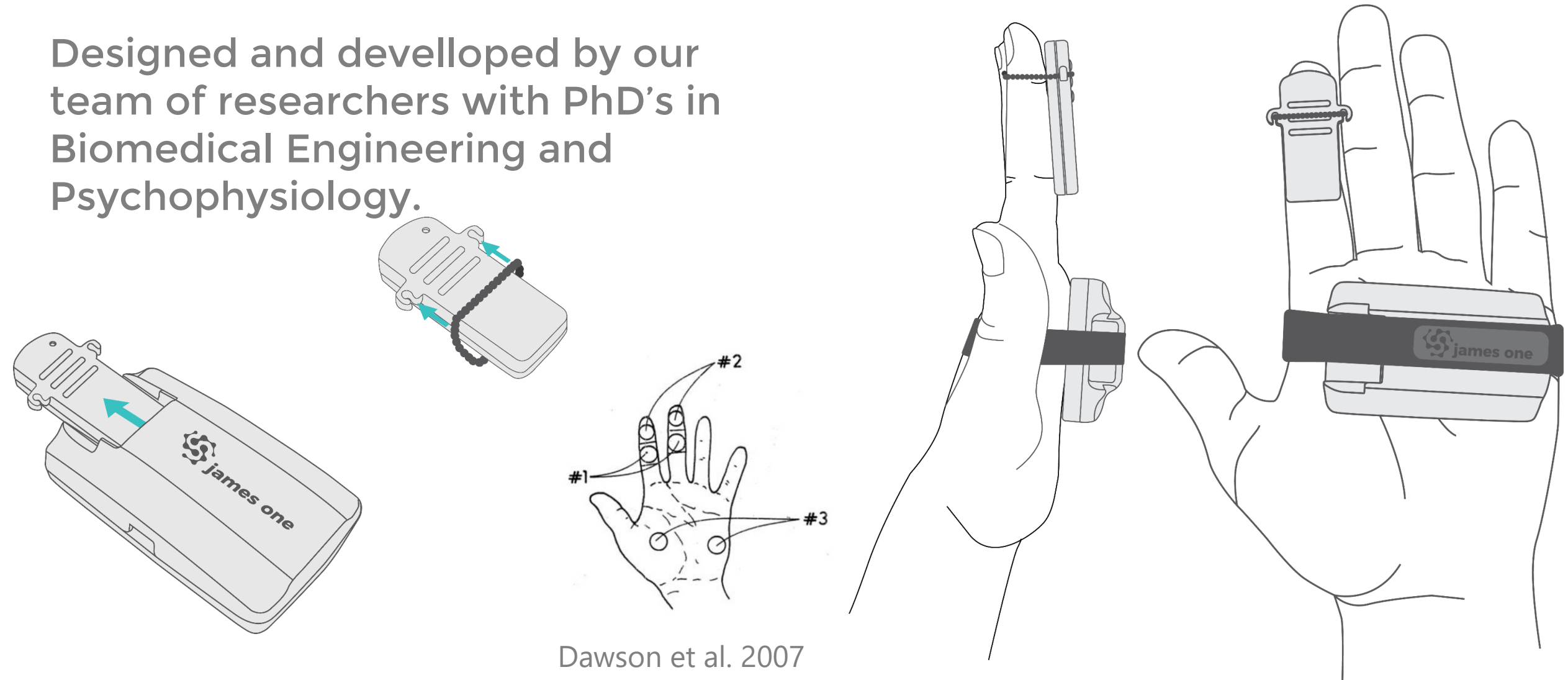
Equal
(OR BETTER)



?

Challenge #1

Designed and developed by our team of researchers with PhD's in Biomedical Engineering and Psychophysiology.



Dawson et al. 2007

Challenge #1

Validating James One

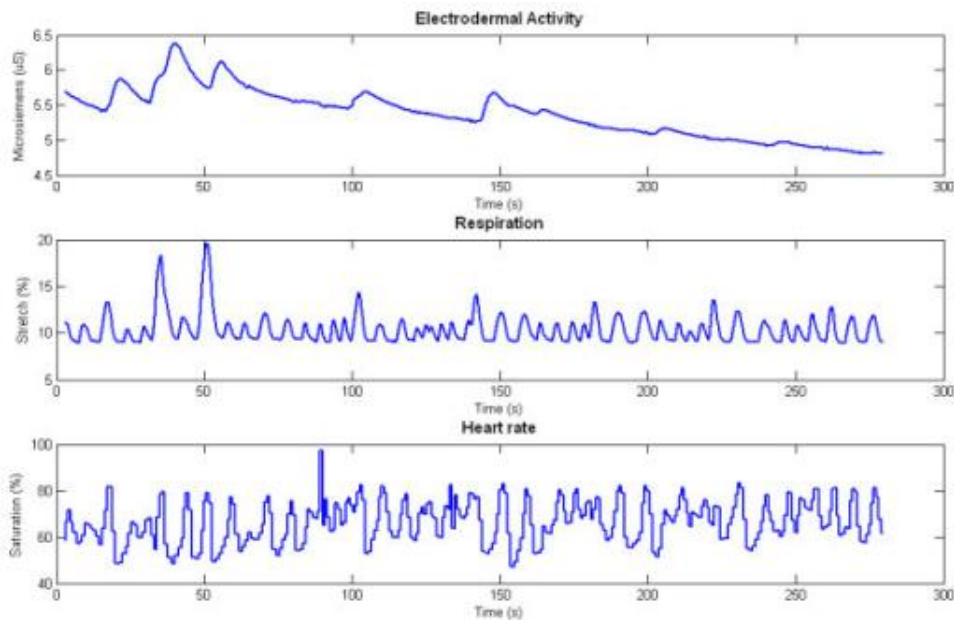


Challenge #2

Signals are the same or better ✓

Able to discriminate relevant events

Have a real impact for business



SOMETHING
MEANINGFULL

Challenge #2

Which Events?

HAPPINESS DISGUST
FEAR NOSTALGIA
EXCITEMENT ATTENTION
PLEASANTNESS AROUSAL MEDITATION
JOY SADNESS
PERSUASION



Challenge #2

Meta-analysis: ANS correlates of emotion in animated stimuli

2520 studies screened for biometrics & emotion

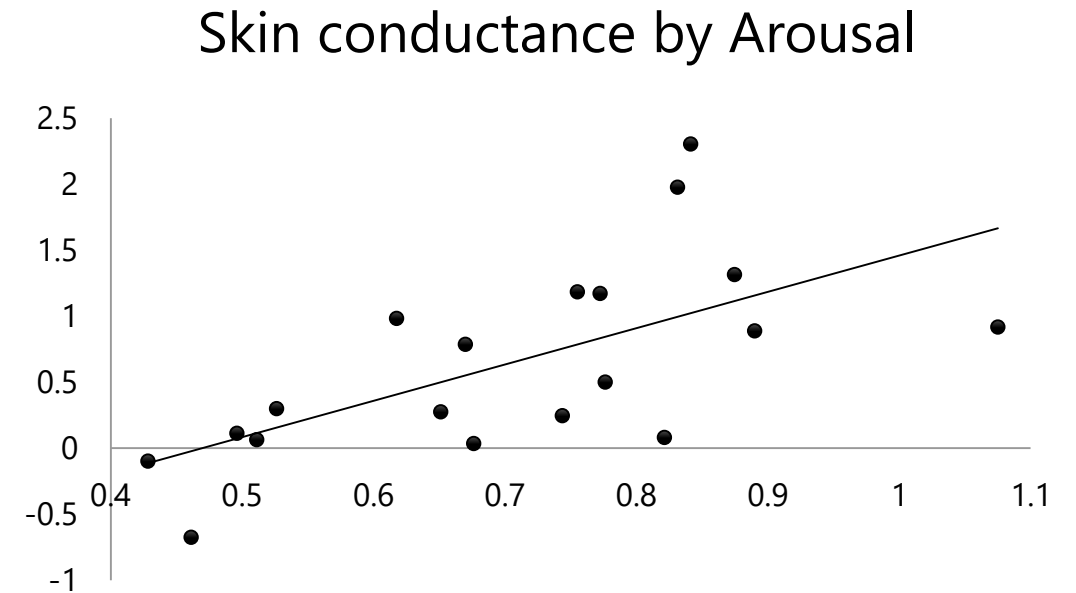
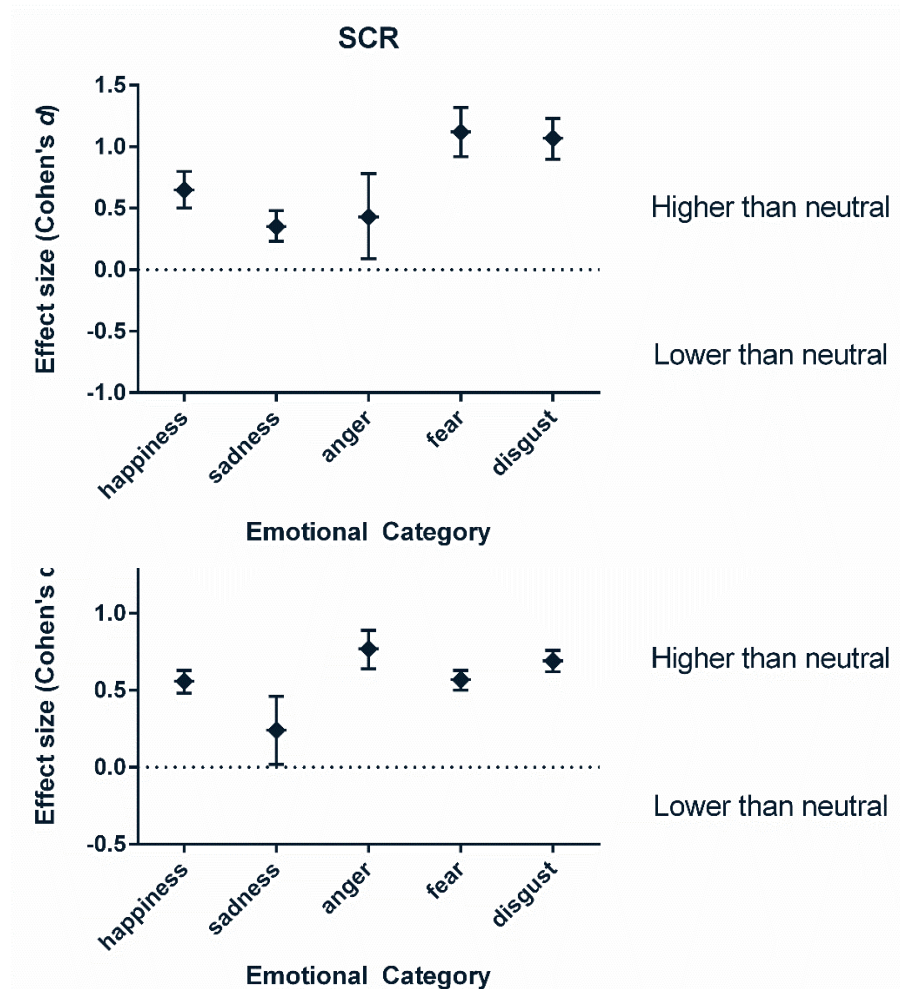
550 fully analyzed

Exclusively film and movie stimuli



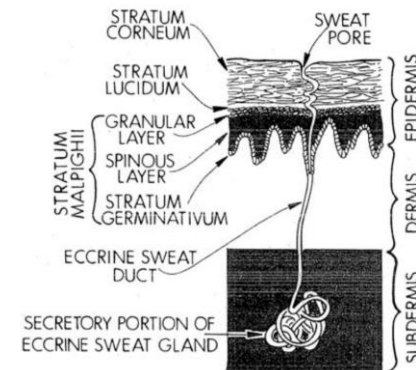
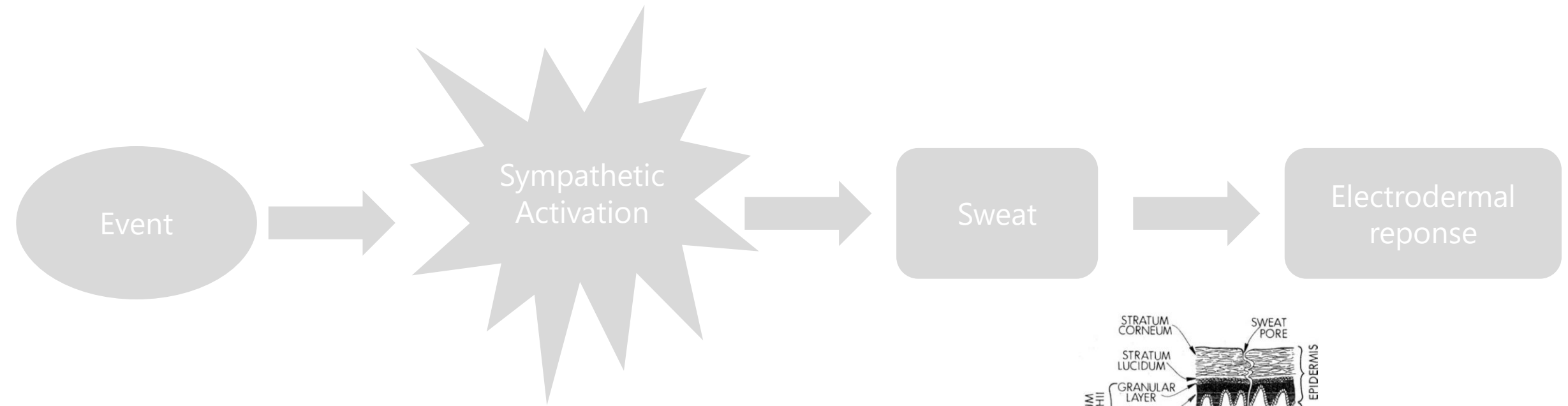
Challenge #2

Meta-analysis: ANS correlates of emotion in animated stimuli



Challenge #2

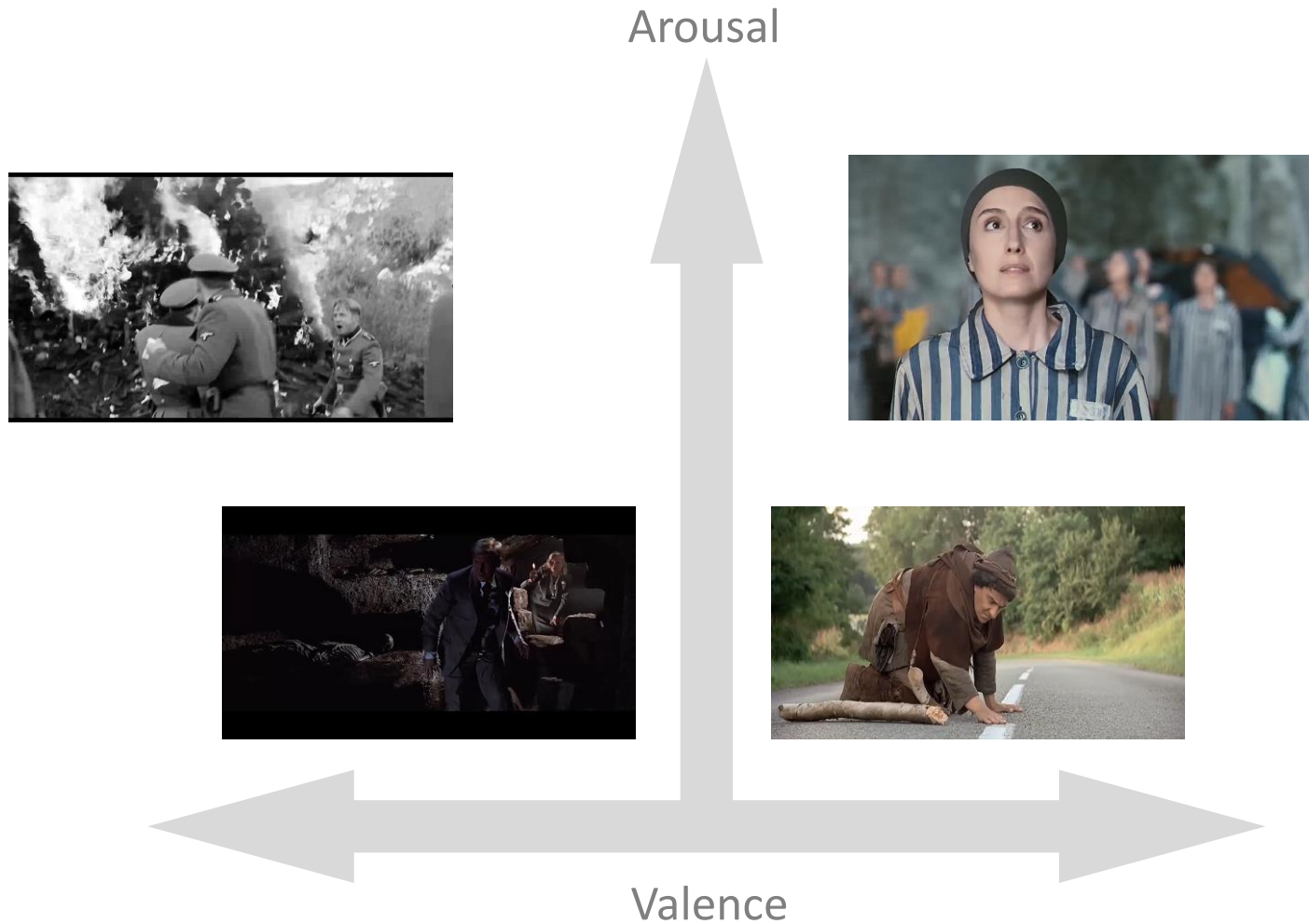
What is electrodermal activity?



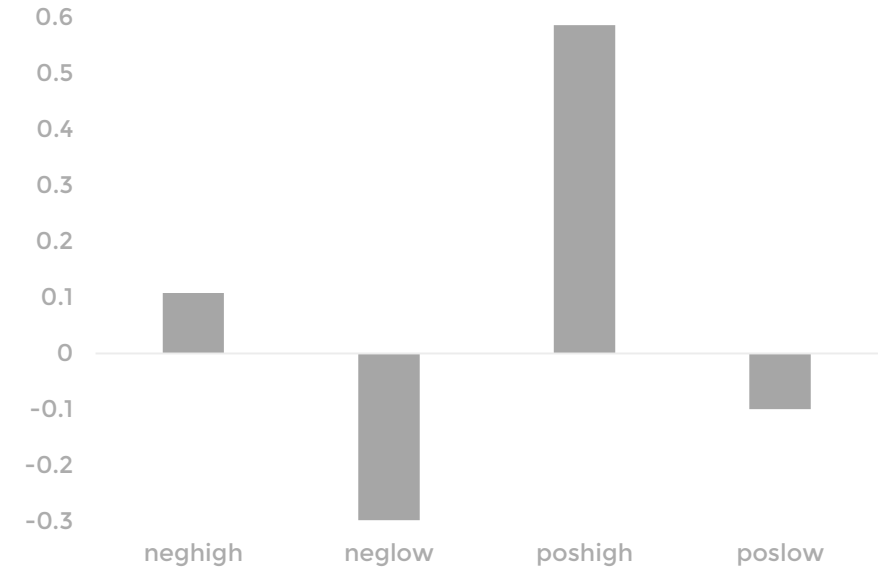
Dawson et al. 2007

Challenge #2

physiological data to discriminate validated stimuli sets



SCL by valence and arousal





OVERALL SUMMARY

TIMELINE ANALYSIS

QUESTIONNAIRE

Print



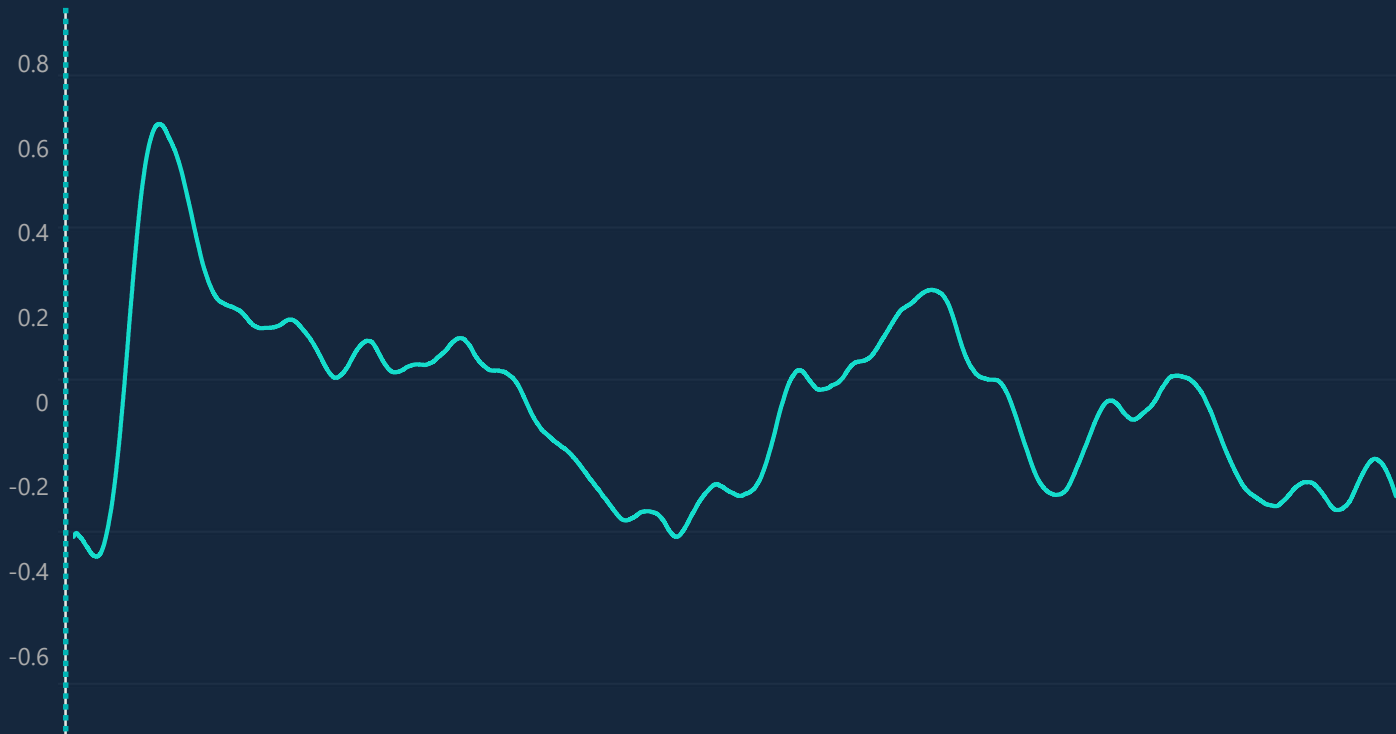
Biometrics

segment: None

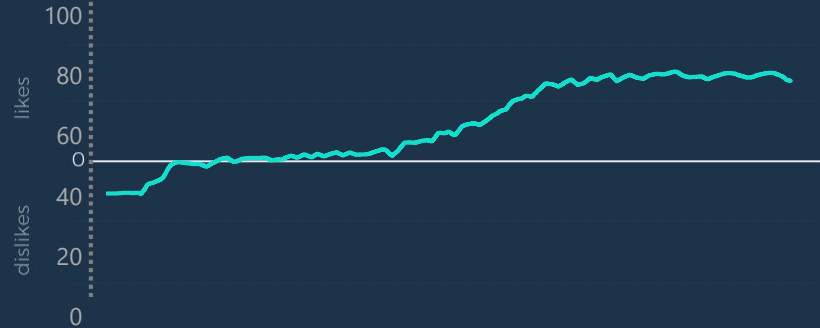
100%
Participants

OPTIONS

☐ Error margin (95% CI) ☐ Benchmark



Likes/ Dislikes



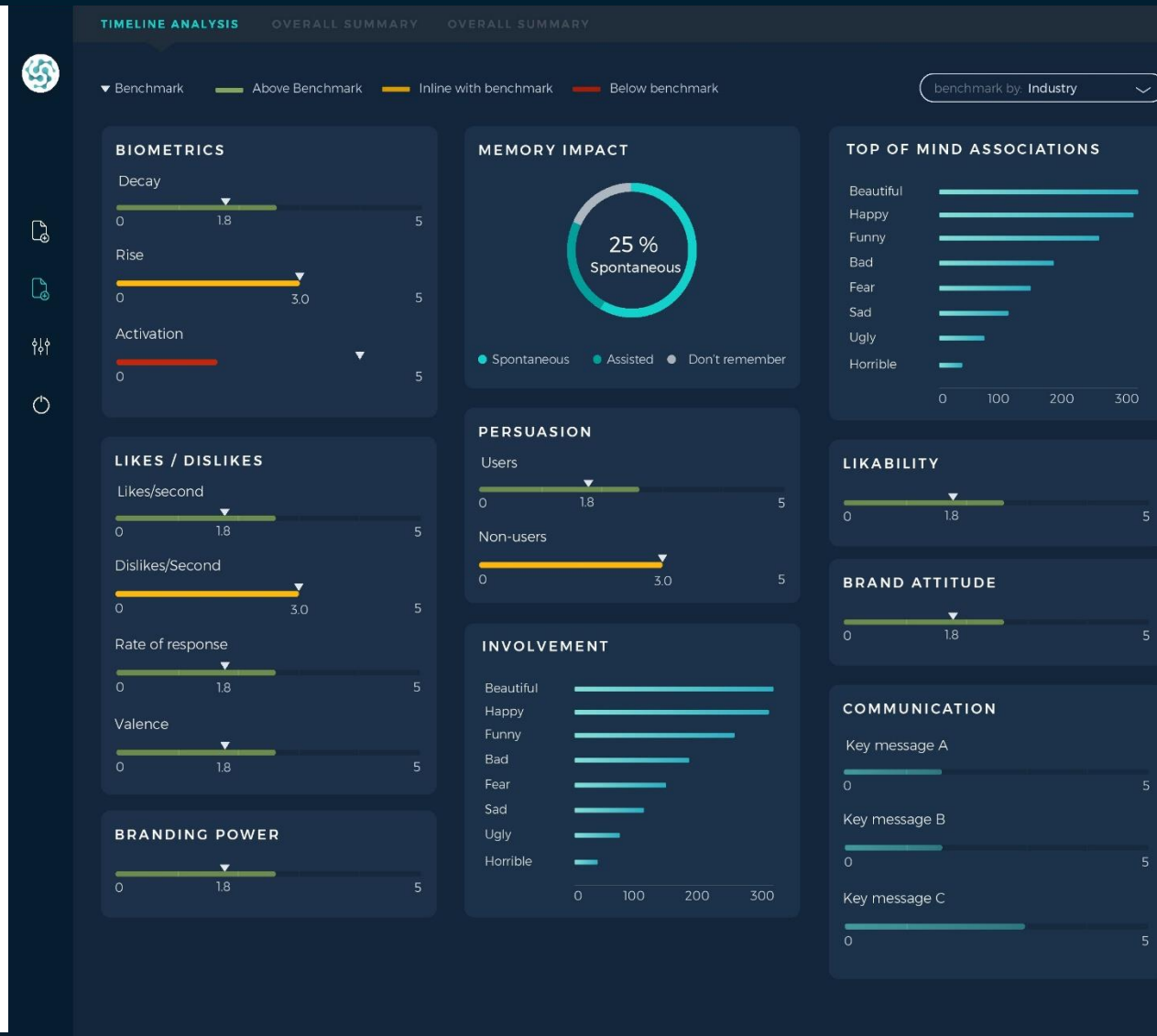
Challenge #3

Signals are the same or better ✓

Able to discriminate relevant events ✓

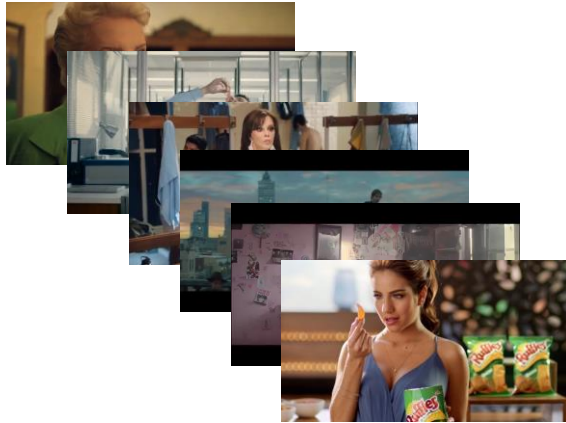
Have a real impact for business

Which outputs are we providing clients?
What are they good for?



Challenge #3

Use case 1: Estimating the impact of ads



Reel
Visualization



Memory Impact
for Random "Target"



Randomized
"Target" 2nd
Visualization



Complementary Specific
Questionnaires for
"Target"



Challenge #3

Use case 1: Estimating the impact of ads

Memory Impact



Arousal



Ad 1 and Corona have opposite levels of memory impact and emotional arousal - Let's focus on these ads!

What does **low** impact look like?





Biometrics

Select a segment



100%
All Participants

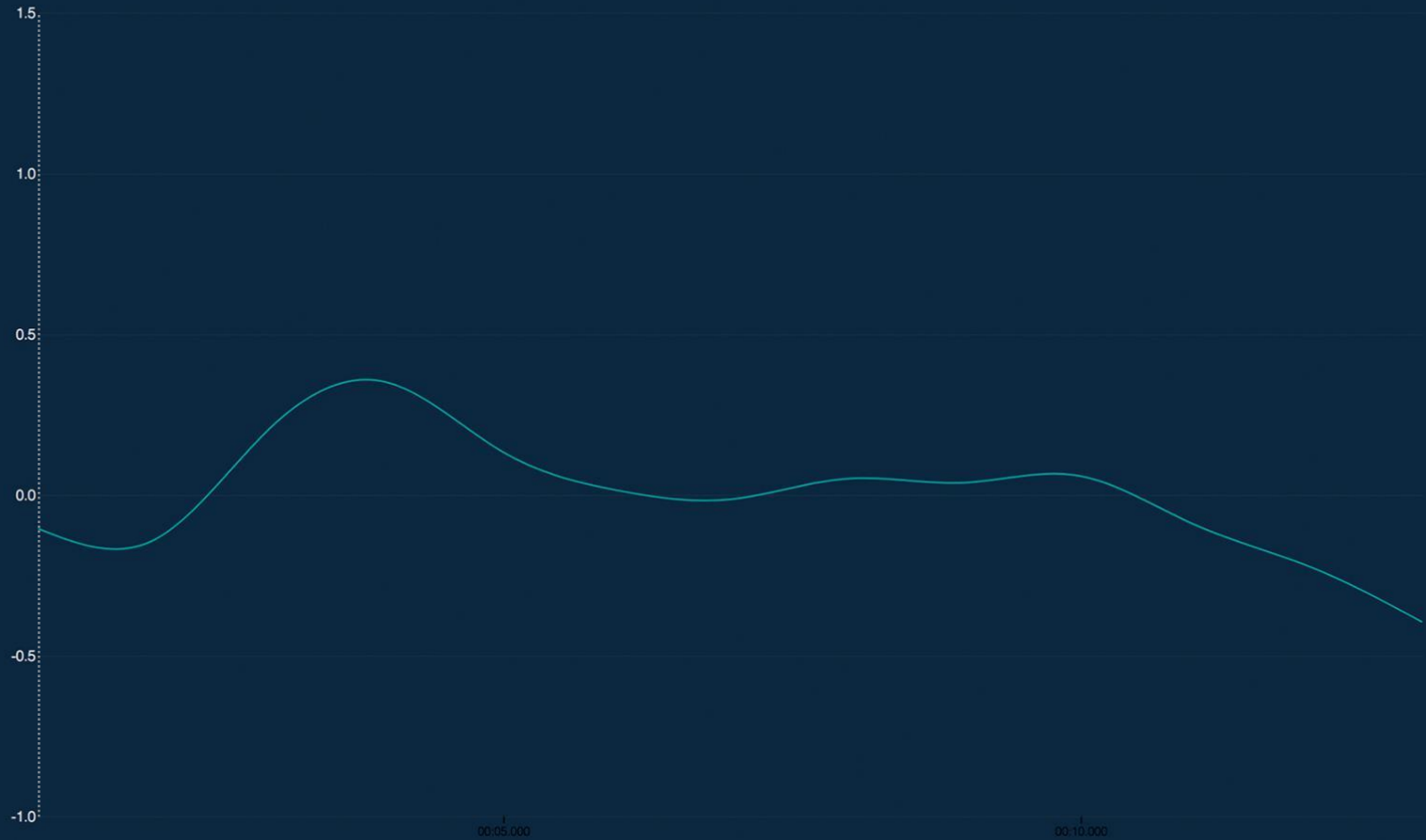
OPTIONS



Error margin



Benchmark



Likes and Dislikes



What does **high** impact look like?





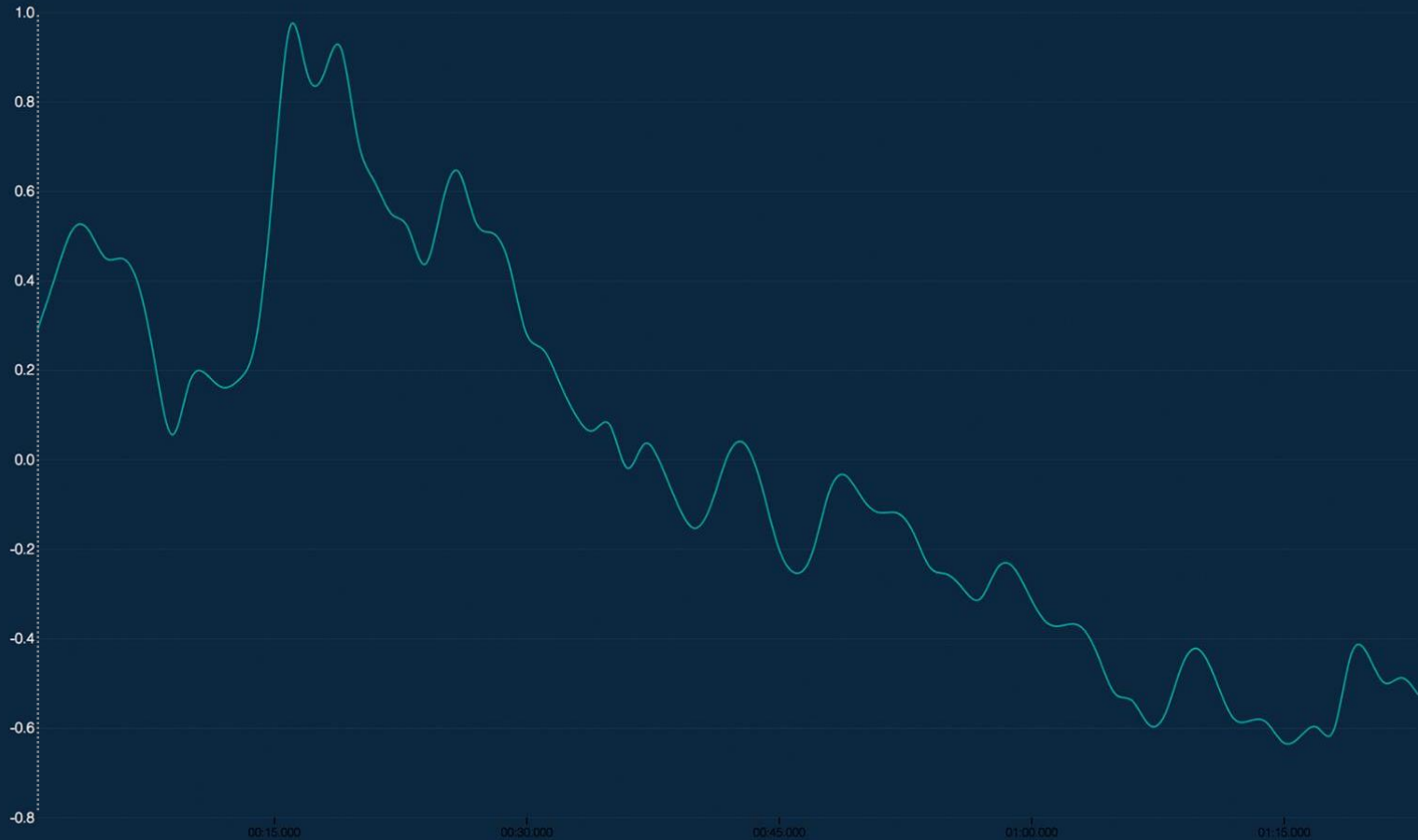
Biometrics

Select a segment ▼

100%
All Participants

OPTIONS ☐ Error margin ☐ Benchmark

Emotional
Arousal



Likes and Dislikes

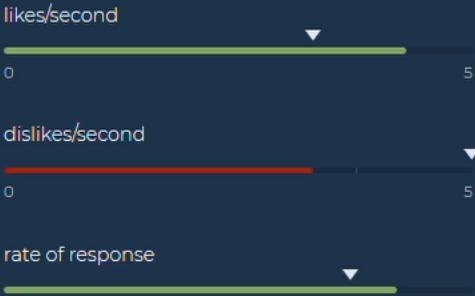




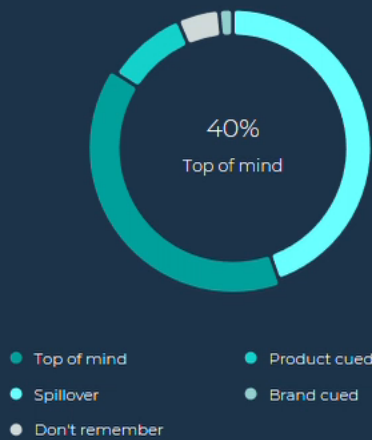
BIOMETRICS



LIKES/ DISLIKES



MEMORY IMPACT



TOP OF MIND ASSOCIATIONS



PERSUASION



BRAND ATTITUDE



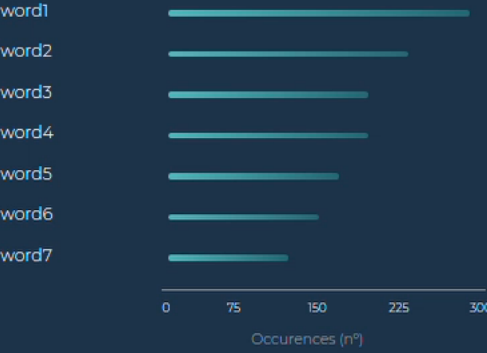
BRANDING POWER



LIKABILITY



INVOLVEMENT



▼ Benchmark Above benchmark Inline with benchmark Below benchmark

Challenge #3

Use case 2: Estimating and forecasting the impact of entertainment programs



1 - Identify crucial moments

2 - Characterize the emotional tonus of the whole content, with second-wise granularity

Nice... but can we do more?



Challenge #3

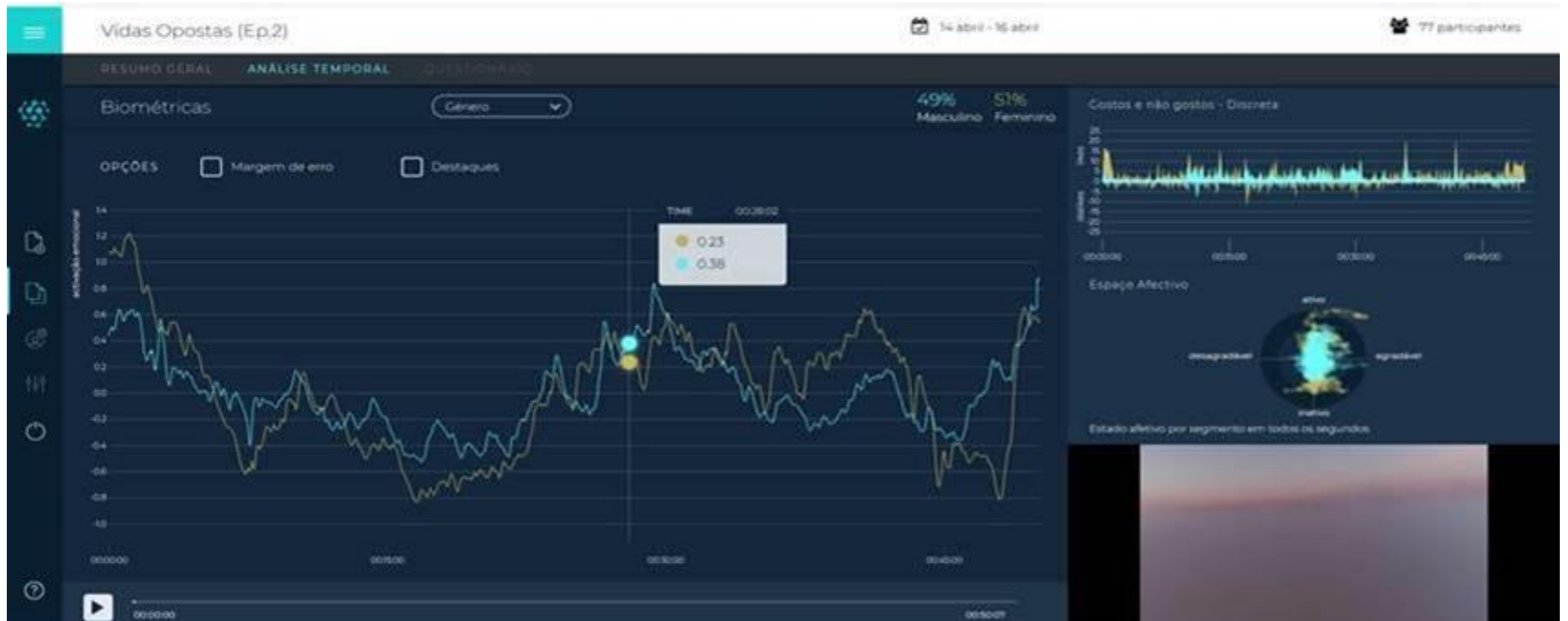
Audience ratings are king

“Can you tell me anything about the potential impact on audience ratings?”



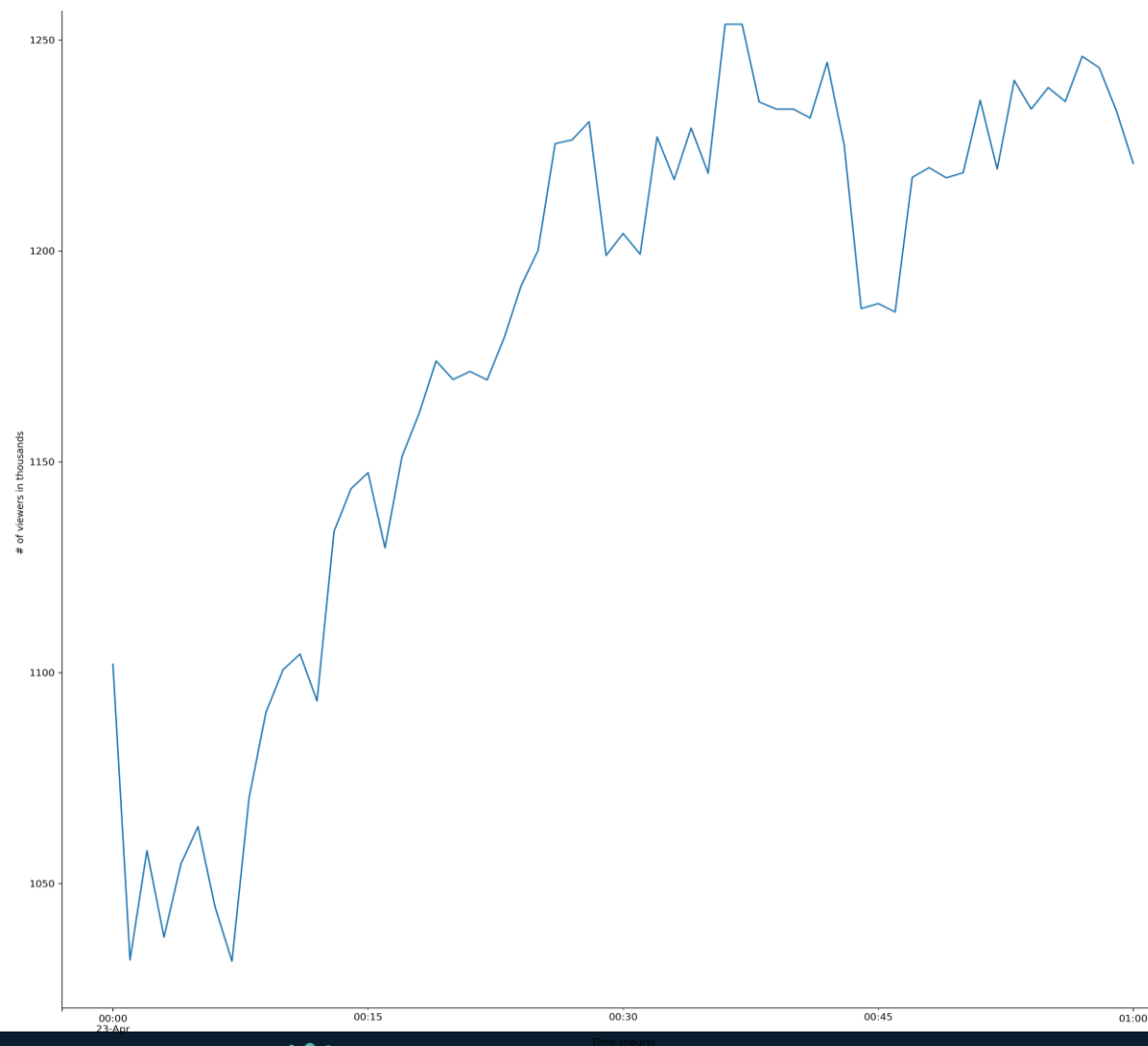
Challenge #3

Can we go from this...



Challenge #3

To this?

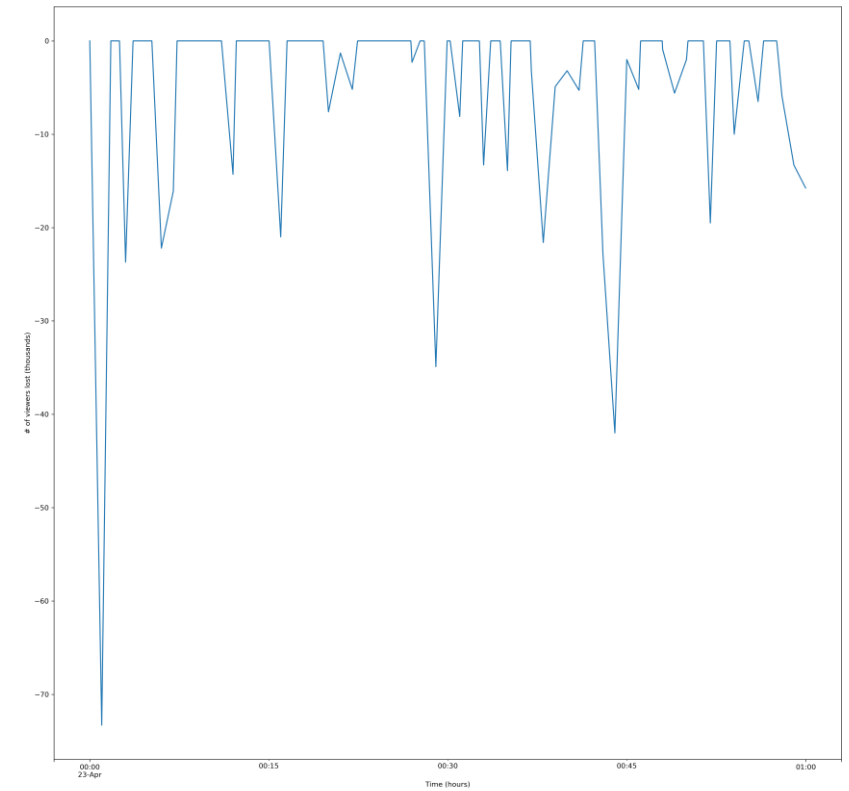
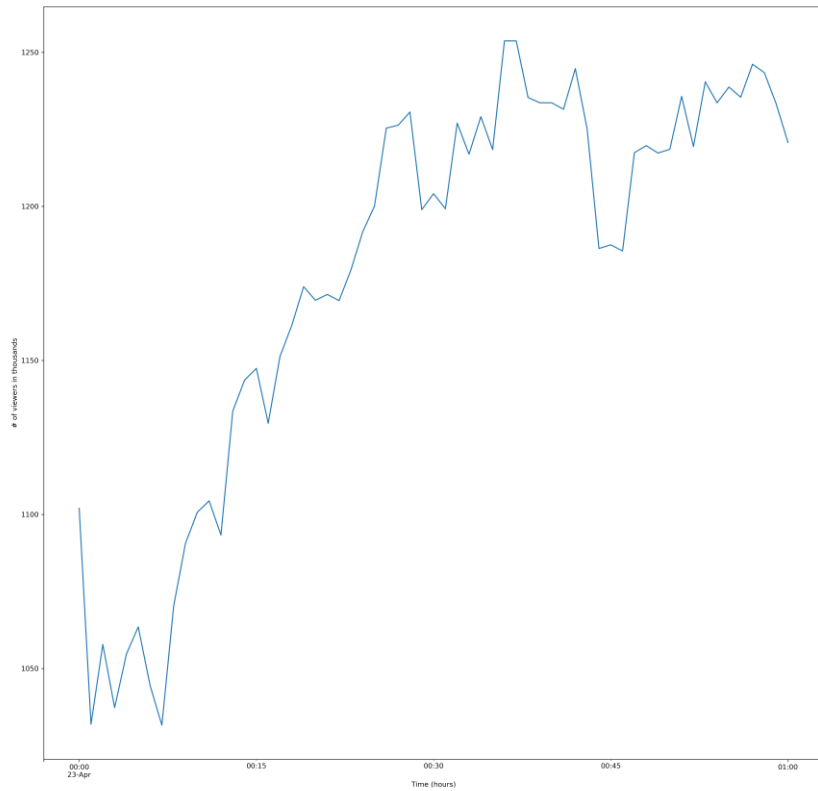


Yes



Challenge #3

Step 1: Calculating Viewer Loss per Minute



Challenge #3

Step 2: Data Modelling

Long-Short Term Memory networks → a subset of Recurrent Neural Networks (RNN), which use a special type of layer

Exceptionally good at modelling relationships across time between one or more variables – taking into account temporal dependences

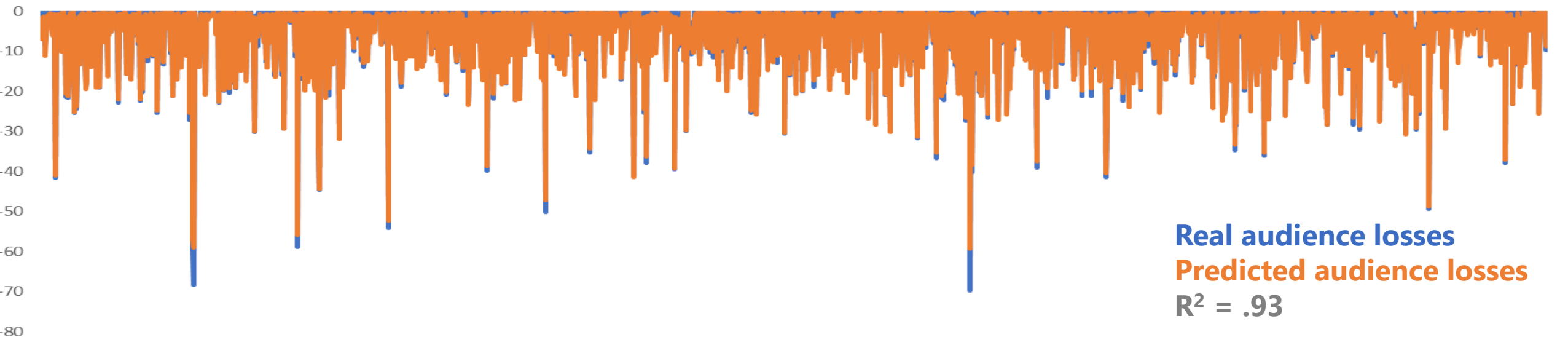
For each time-step, we want to predict the ratings' losses based on the last n observations of our predictors



Challenge #3

Results

“Vidas Opostas” Ep. 18



In Conclusion

It is possible **to scale biometric media testing** with validity

Biometric ad testing brings another **layer of data & deeper insights**

Improving ad optimization + placement at scale

Taking media pre-testing to another level



Thank you!

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