

# Zeez

sleep improvement using wearables and n-of-1 experiments

Shiraz Chakraverty

Ed Gelman

Marcelo Scatolin Queiroz

Peter Trenkwalder

# The opportunity:

- Insights from wearables are entirely retrospective
- The science of sleep is blooming, and consumers are increasingly objectively tracking themselves
- Healthcare industry is not entering the wellness space
- Online communities are springing up to address these problems
  - opportunity to deliver personalized, actionable insights

hardware:

objective  
measurement



OURA



software:

statistical rigor and  
randomization of  
treatments

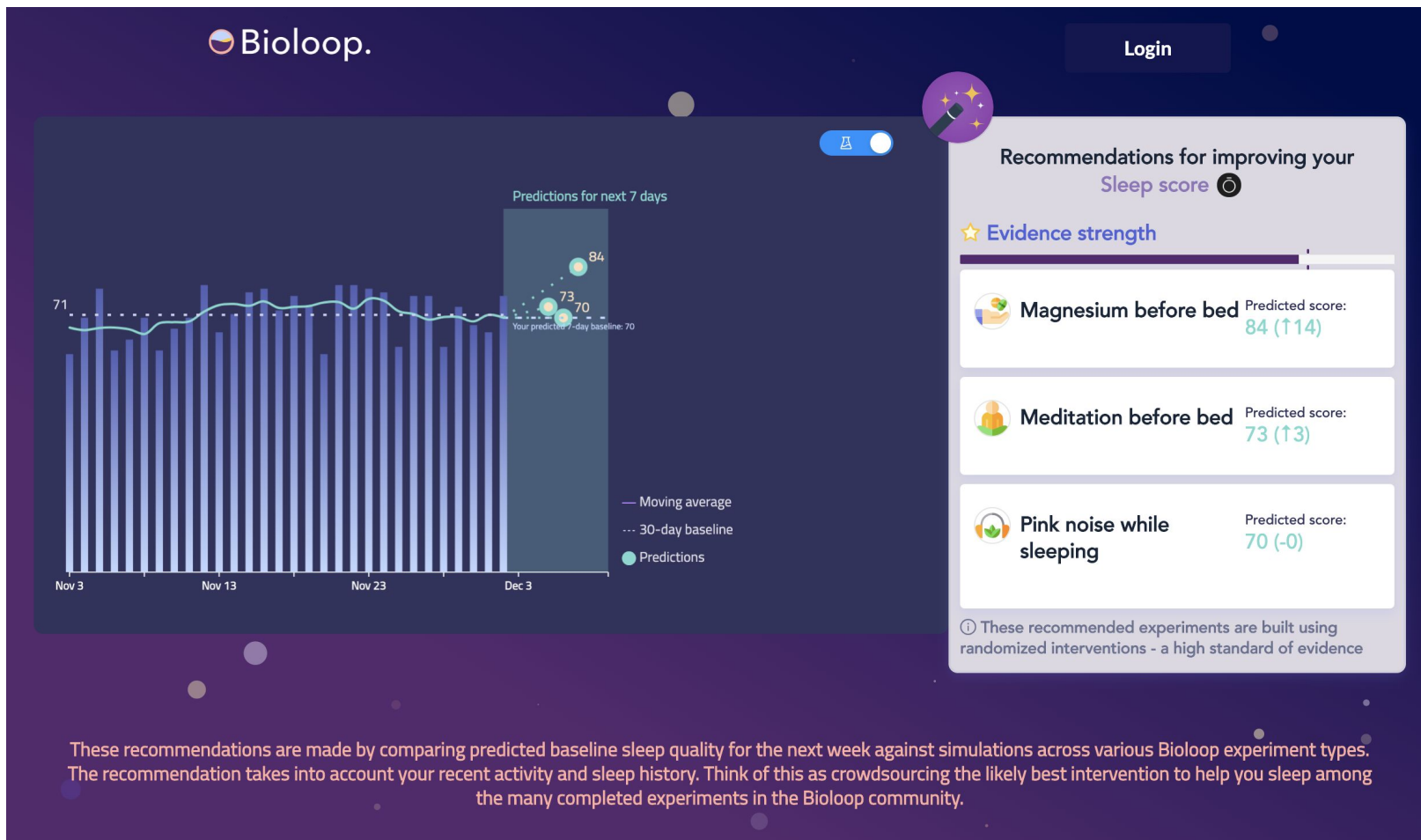


The technologies:

# Our Plan:

- gather lifestyle and habit data from many Oura ring users
- gather randomized experiment data of “life hacks” from Bioloop
- extract signal from noisy biometrics
- simulate alternative habits and map expected sleep outcomes
- recommend the “optimal” tweaks for the user, today

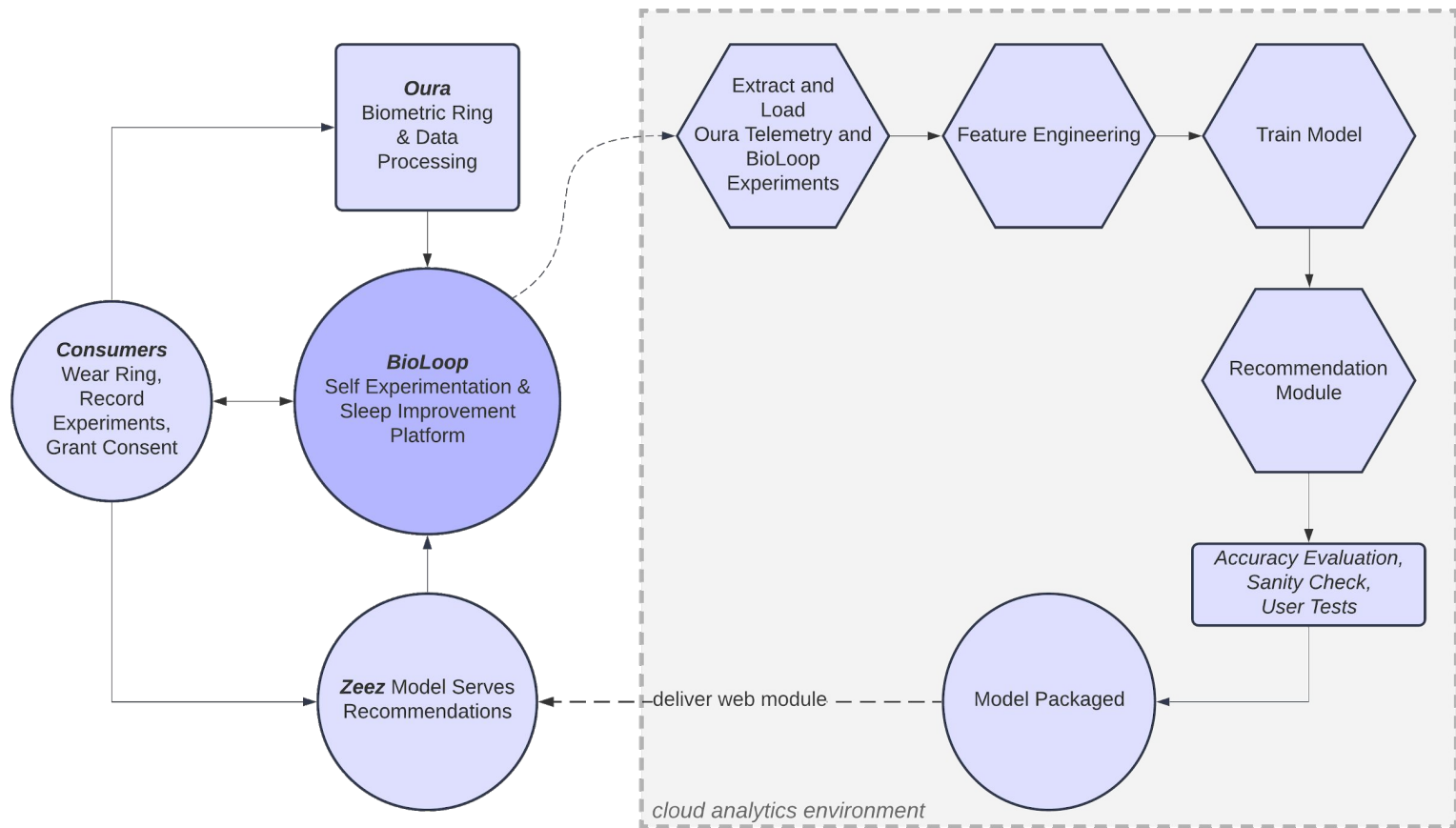
# Demo:



# Key Facts:

<b>opted-in participants:</b>	98
<b>person-days recorded, telemetry:</b>	28,400
<b>experiment types:</b>	18
<b>randomized treatment &amp; control days:</b>	766
<b>champion model:</b>	Random Forest

# Data Flow



# Model Performance:

**Outperform naive baseline**

**MAE = 2.5**, “Half of the time, the model is wrong by less than 2.5 points”



# User Story: Marcelo

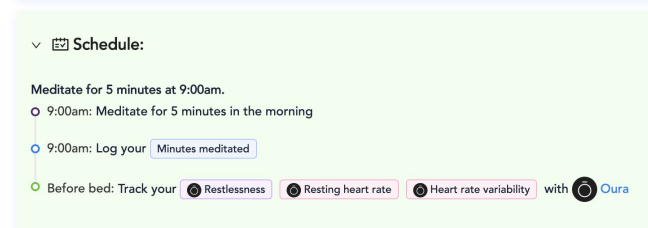
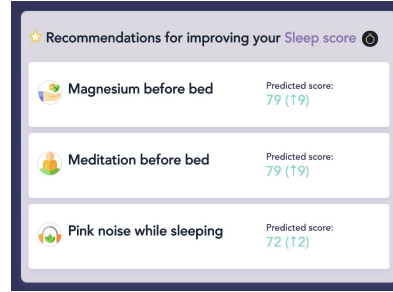


*Marcelo recently bought an Oura ring to measure his sleep quality and joined Bioloop to actively improve his sleep. He initially wanted to run a self-experiment, but a particularly busy new job schedule got in the way.*

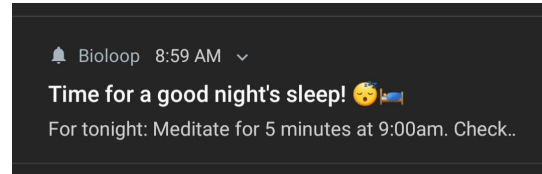
*Today, he logged into Bioloop and saw that...*

“Meditation most likely to increase sleep quality”

Marcelo started an experiment in meditation, set an alert, and closed the app.



The next morning, the Bioloop app reminded Marcelo to meditate. He did so, using the new Oura “Moment” feature to guide the meditation.



Marcelo looks forward to scientifically measuring how much a meditation habit improves his sleep!

# Next steps:

- integrate product into Bioloop
- tune recommender module
- improve model accuracy