# REFEFINING ACTIVE LISTENING Integrating consumers' verbal and non-verbal cues with machine learning









Face & emotion recognition are not by-products of machine learning but are rooted in rigorous psychological research.







The expressions of the emotions in man & animals (1872)

### THERE IS NOTHING NEW ABOUT IT



### Charles R. Darwin (1809-1882)



First published by Paul Ekman & Wallace Friessen 1978, Facial Action Coding System (FACS) is a system to classify human facial movements by their appearance on the face. Movements of individual facial muscles are encoded by FACS to represent different emotions.

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### FACIAL ACTION CODING SYSTEM (FACS)

### Main codes

2

3

4

5

### Head movement codes

Eye movement codes

Visibility codes

Gross behaviour codes

AU number 0 ... 28

AU number 51 ... M83

AU number 61 ... M69

AU number 70 ... 74

AU number 29 ... 98\*



### **1980s 2-Dimensional face model**

• Appearance-based approach, faces represented by their **pixel** intensity map

## **1970s**

### **Extraction of geometric face**

### shape and feature

FACS that uses Action Unit to encode 6 common face emotions

### FACS IN COMPUTER VISION DEVELOPMENT

## 2000s

### Automatic recognition of facial expression

• Real-time combined **2D&3D** using Active Appearance model (AAM), Hidden Markov Model, Deep Bayesian Network, etc.

## **1990s**

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**3-Dimensional face model &** 

### objects tracking

Apply algorithms of Support Vector

Machine (SVM) and AdaBoost, etc. in

object and face recognition.

### **2010s Revolution in emotion recognition**

- Deep convolutional neutral network (CNN) significantly improves the scalability and accuracy
- 7 common face emotions











![](_page_11_Figure_1.jpeg)

![](_page_12_Figure_0.jpeg)

### SEASON A | OVERALL

### Peak % of happy

![](_page_12_Figure_3.jpeg)

![](_page_12_Picture_4.jpeg)

![](_page_13_Figure_0.jpeg)

### SEASON B | OVERALL

### Peak % of happy

![](_page_13_Figure_3.jpeg)

![](_page_13_Picture_4.jpeg)

Text analysis

Sentiment analysis

![](_page_14_Figure_2.jpeg)

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### **ORIGINAL OBSERVATIONS + TEXT ANALYTICS**

Negative phrases

Detect inconsistencies with emotion analytics

Positive phrases

![](_page_14_Picture_7.jpeg)

Before

![](_page_15_Figure_1.jpeg)

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### **REMOVING SARCASM**

After

### Нарру

### **CONCEPT DEVELOPMENT**

Surprised

### **UX / UI EVALUATION**

### Confused

.....

### **APPLYING MOODIE IN MARKET RESEARCH**

Calm

![](_page_16_Figure_8.jpeg)

![](_page_16_Picture_9.jpeg)

![](_page_16_Figure_10.jpeg)

![](_page_17_Picture_0.jpeg)

![](_page_17_Picture_2.jpeg)

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![](_page_18_Figure_0.jpeg)

![](_page_18_Figure_1.jpeg)

![](_page_18_Picture_2.jpeg)

### MOODIE: SOLVING BOTTLENECS IN QUALITATIVE RESEARCH

2

3

With the help of AI and emotion-analytics, we are now able to remove bottlenecks in qualitative research and scale it without compromising on quality.

![](_page_19_Figure_3.jpeg)

### Cost

### Cost

Cost related to human qualitative analysis is significantly reduced.

### Inefficiency

The time required to complete analysis is also reduced.

### Inconsistency

The inconsistency in the observations and interpretations between different researchers and clients is removed.

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![](_page_20_Picture_1.jpeg)

![](_page_20_Picture_2.jpeg)