

Smart Emotion Detection Platform

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Tips to be Covered

- Outlines
- Introduction
- Motivation
- Demo
- Challenges
- Future work

Outline

- Mental Health
- Basic Emotion
- Emotion Detection Methods
- Previous Researches
- Proposed Platform

Introduction

- Aspect of wellness:
 - Physically
 - Mentally (the most important)
 - Spiritually

Mental Health

- Mental health can lead to new problems such as:
 - Learning
 - Motivation
 - Attentiveness
 - Concentration
 - Conducting
 - Organization
- Emotion detection is a promising way to enhance the quality of mind

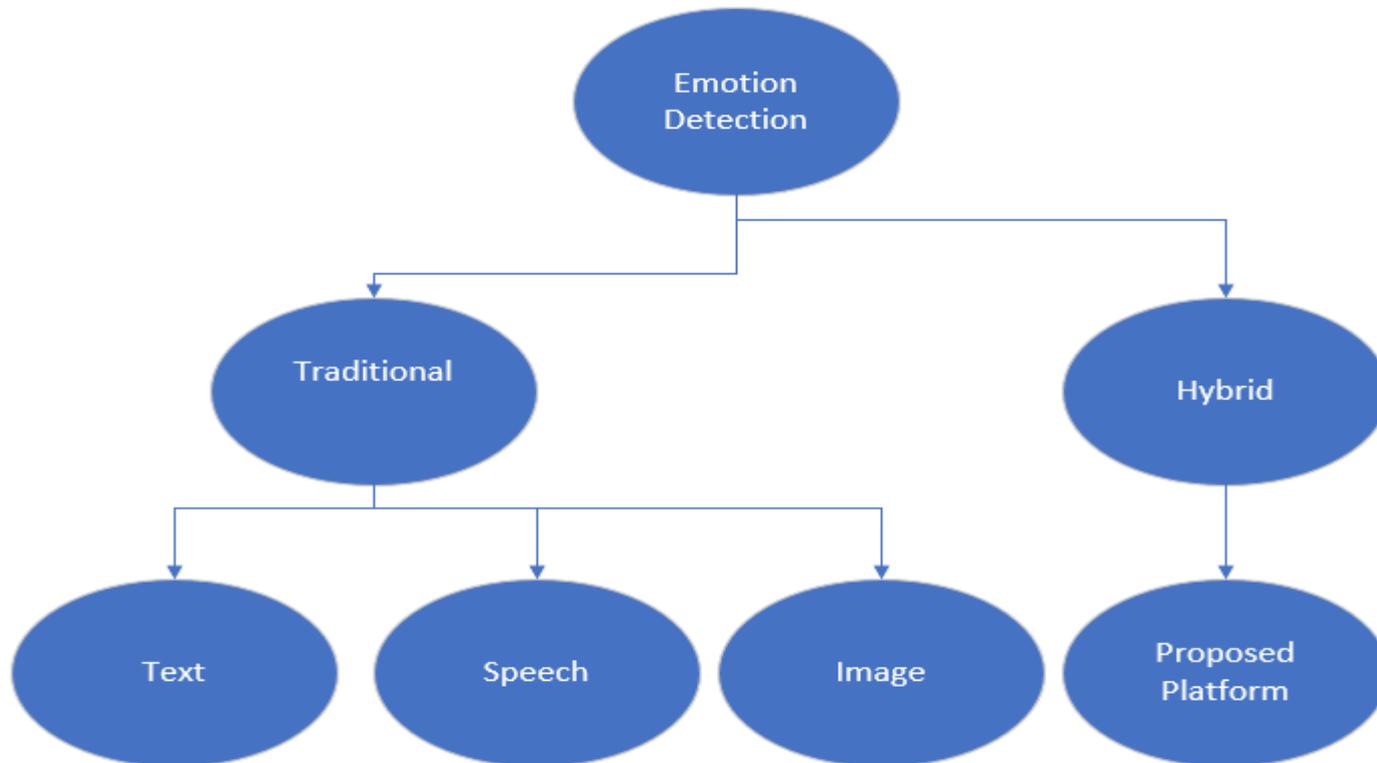
Emotion detection

- Industrial
 - Selling product based on customer's current emotions
 - Selling product based on customer's current needs
- Health care
 - Anger management
 - Preventing accident
- Interaction with autistic kids
- Increasing security in public places

Basic Emotion

- Sadness (Concentration of this platform)
- Fearfulness
- Disgust
- Anger
- Joy
- Surprise
- Contempt
- Neutral

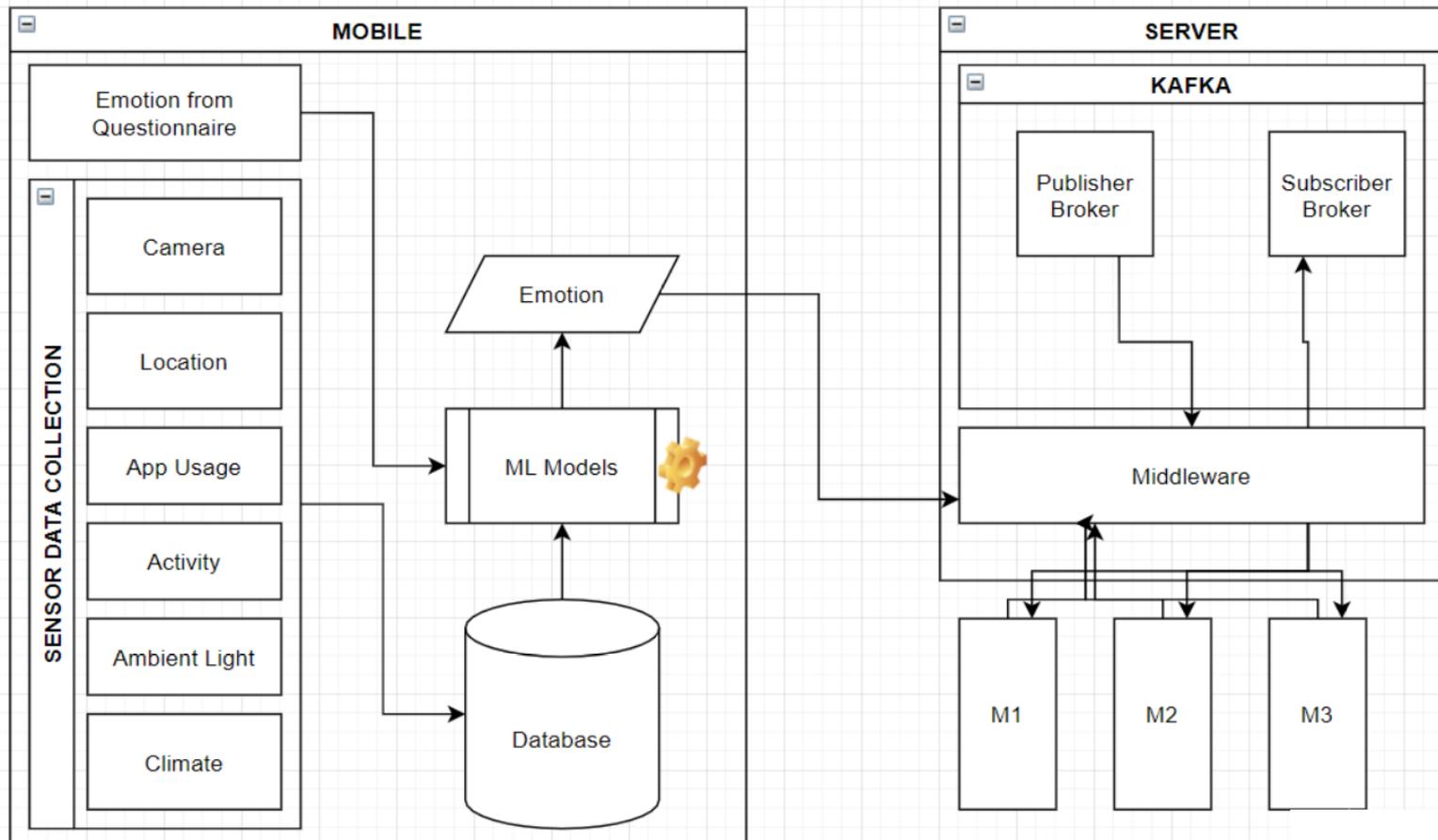
Emotion Detection Methods



Previous Researches

- Traditional
 - Single Modal
 - Not enough accuracy
 - Boring for user
- Hybrid
 - Multi Modal
 - Acceptable accuracy
 - Everything in back end
 - System parameters are not considered

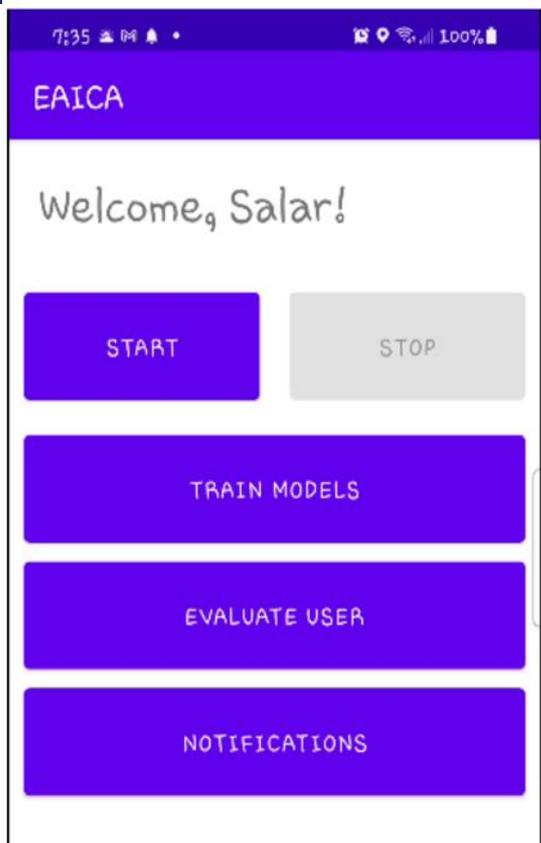
Proposed Architecture



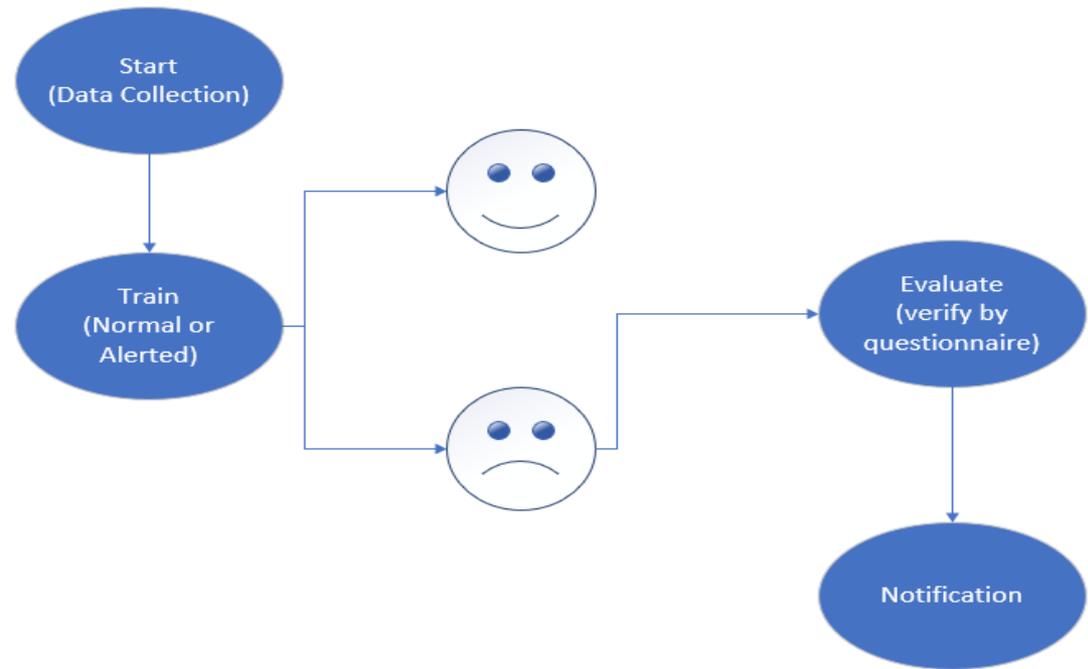
Contribution

- Using Edge computing
 - Cellphone processing
 - Load balancing between server and edge
 - Increasing response time
 - Power efficiency
- Using Kafka
 - Decreasing delay
 - Real time notification
 - Scalability
 - Availability

Mobile side of EIACA



Mobile Interface



Mobile Flow

Data Collection (Start)

- Collect 120 past days log from cellphone in order to have initial data whenever it installed
- Update every day data by night
- Collecting Data from user cellphone
 - Activity
 - Call log

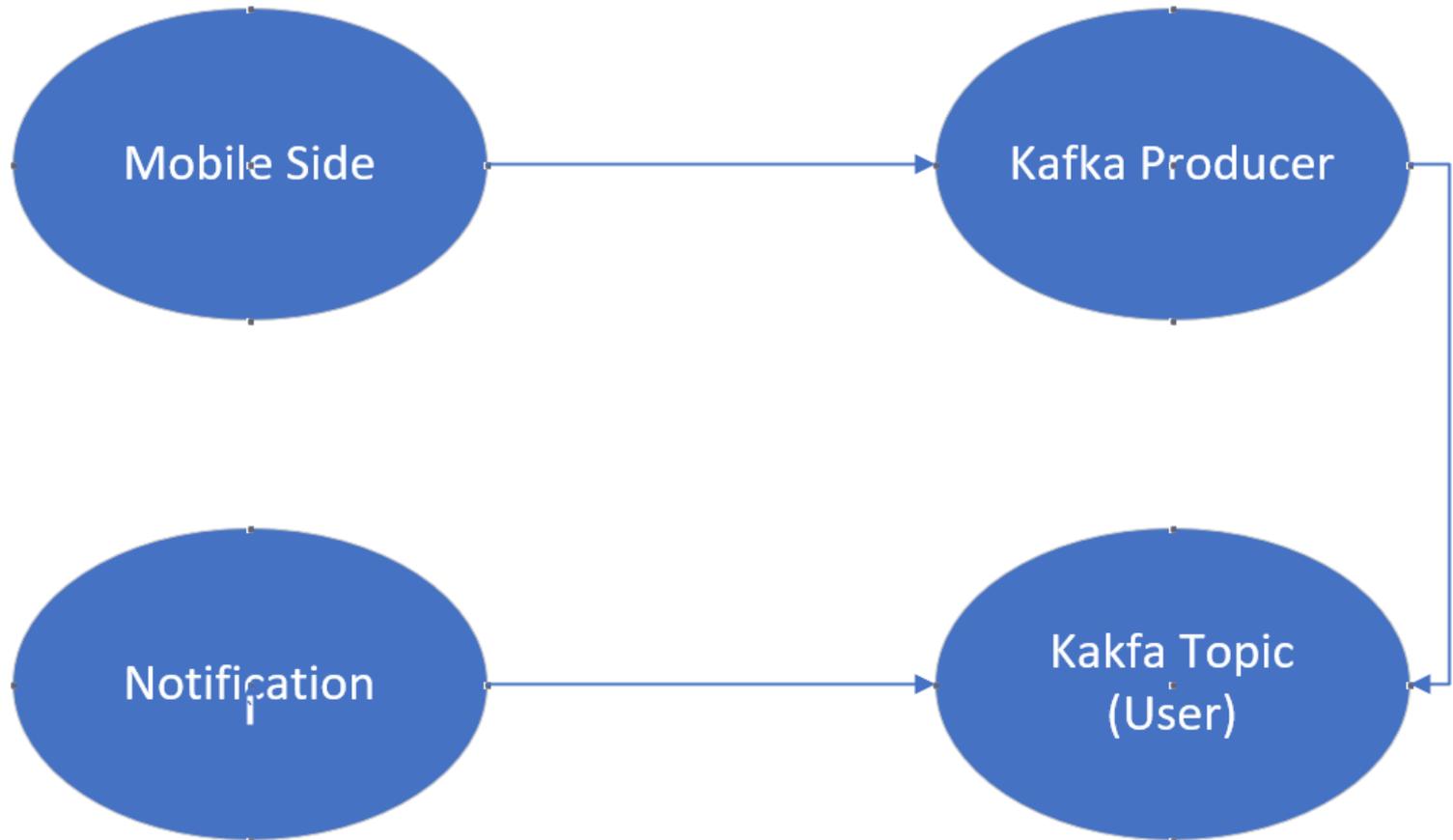
Data Analyze (Train)

- Most of data are habits
- ARMA is promising
- Calculate status of different sensors
- If there is any significant deviation in any sensors for underdo activity then it become alerted
- Currently uses static 40 percent threshold
- Overdo is not a problem

Verifying Emotion (Evaluate)

- Everything is in background unless this part which uses user feedback
- Help to detect the alerted cases by asking questions
- Uses Luben psychology questionnaire to verify the status of user.

Server side of EIACA



Future Work

- Dynamic Weighting Scheme
- Involving more modalities—sensors
- Aggregation
- Data Compression
- Underestimation/Overestimation
- Resource Constraint--Battery Usage Issue
- Dynamic profile for split workload execution
- Incorporate the mental status of the expert/physician of the systems as well, since when the physician/expert does not feel concentrated, its recommendation/supervision is faulty/erroneous.
- Short-term/long-term advice
- Middleware approach
 - ElasticSearch/ Solr
 - Spark/Storm
 - MongoDB/ Cassandra/ KSQL/ DynamoDB

Future work-cont

- Correlated Emotions
 - Proactively prevent further negative correlated emotions
- Proactively build a profile for any new user arrival from similar already existed profiles/data
- Process/data transfer prioritization due to resource-constraint of cellphones (i.e., battery)
- Privacy issue
- Utilizing middleware infrastructure to migrate processing/data load to mitigate load-balancing issue
- Fault-tolerance—by virtue of replication
- Time synchronization/data consistency
- Consider financial status of the user when it comes to recommendation part; this is because maybe that user is not capable to apply that advice due to financial burden.

Thank you for your attention.

