AI Based Advertising System

Delivering an ML/AI Strategy, AI for Business Leaders, Udacity

Mohamed Ayman Mahmoud, 2 - 2020

Executive Summary

Purpose of Project

- Create a unique AI Based System for Advertisement
- Enter the AI world through a new solution

Methodology

- Analysis conducted over 4 weeks to assess the product’s position
- 5 potential use cases underwent thorough assessment for feasibility and impact

Path Forward

- 2 use cases identified for implementation

I began with five use case ideas

Age Recognition

Description of Use Case 1
Detect age of pedestrians for ad recommendation

Gender Classification

Description of Use Case 2
Detect gender of pedestrians for ad recommendation

Area Gender Prediction

Description of Use Case 3
Time series prediction of the male/female mass in a certain area.

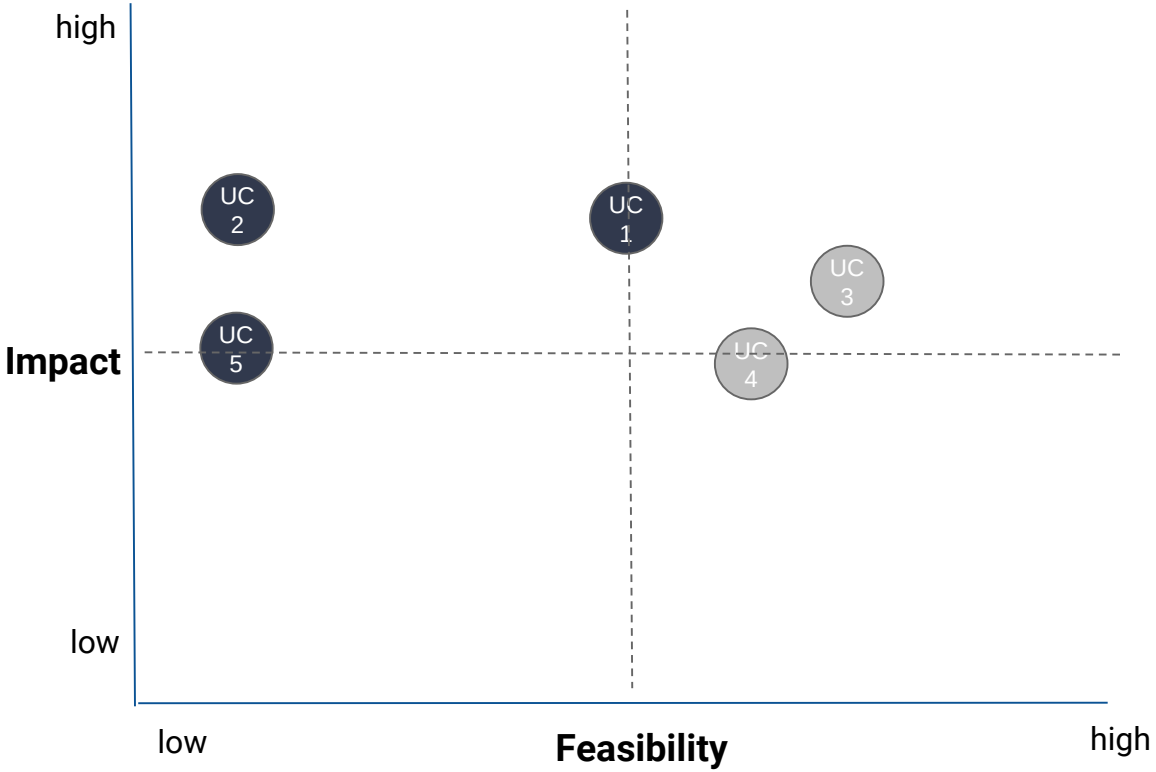
Assistance Using NLP

Description of Use Case 4
The assistance of people walking by the billboard and want to locate something (special version of the board)

Interviewing Using AI

Description of Use Case 5
Cutting time and cost of interviews by creating a model that detects the interviewee facial expression and voice tone. Thus, assessing a final score for him.

I assessed feasibility vs. impact for all cases



Key criteria assessed

- Volume
- Variety
- Velocity
- Veracity
- Value

Transforming our business using ML/AI with these top two use cases

Age Recognition

Description of Use Case

Detect age of pedestrians and assigning them to different age group's for ad recommendations.

Gender Classification

Description of Use Case

Detect gender of pedestrians into male/female/other classes. To assign ads that is suitable for each gender preference.

By executing on these two projects I believe we can drive growth for our business by paradigm shifting and become an AI Based business.

Age Recognition Deep Dive

Process Today

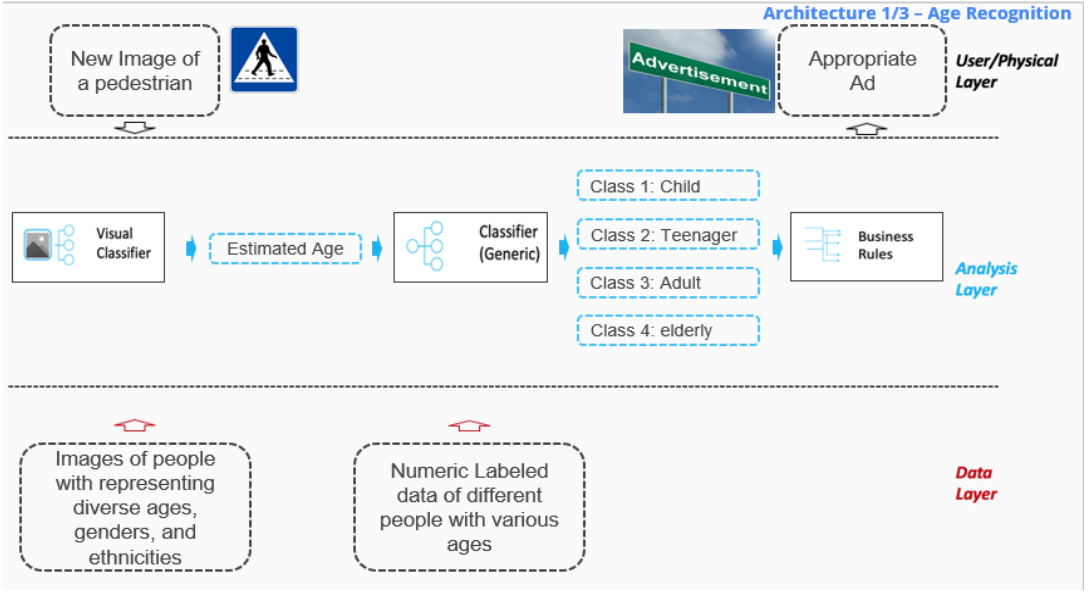
- Pedestrians walk by board
- It shows ads randomly
- The pedestrian sees or ignores it

Process Tomorrow

- Pedestrians walk by board
- The AI system detects his/her age
- They are added in an age group
- Tailored ads are outputted for them and they start to get interested.

The impact of our business will be enhanced thanks to Age Recognition!

Example Architecture



Gender Classification Deep Dive

Process Today

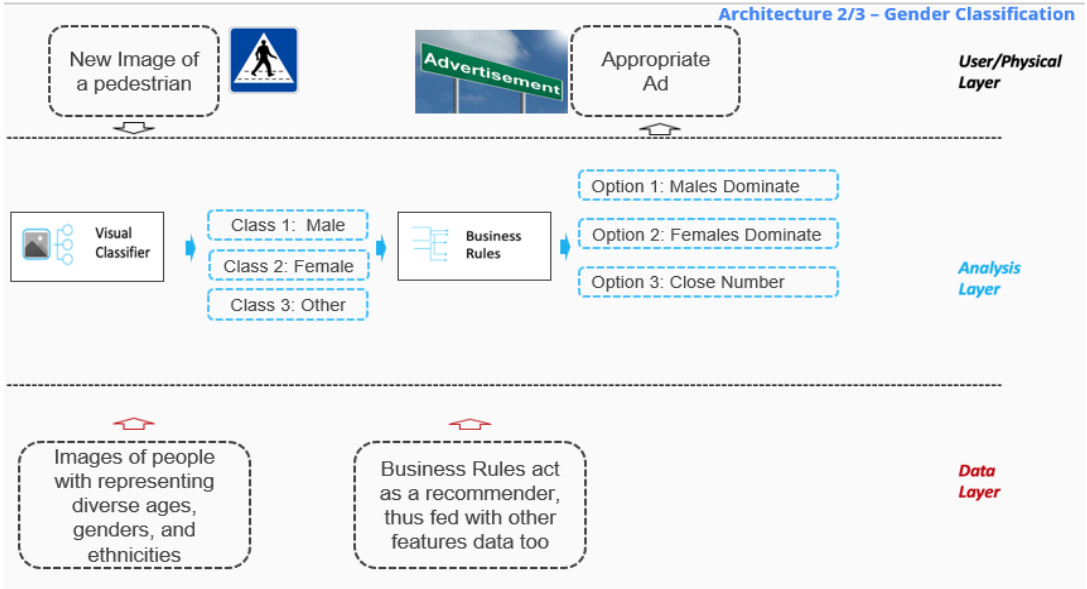
- Pedestrians walk by board
- It shows ads randomly
- The pedestrian sees or ignores it

Process Tomorrow

- Pedestrians walk by the board
- The system classifies their gender
- Then the board will have specified ads
- People around the ad will start gaining interest.

The impact of our business will be enhanced thanks to Gender Classification!

Example Architecture



Risks/Mitigations

	Age Recognition	Gender Classification
Accuracy *Definition*	Concerns: Low Accuracy Plan: Increase Data and age ranges	Concerns: Biased accuracy Plan:Used more metrics with accuracy
Underfitting/Overfitting *Definition*	Concerns: Overfitting Plan: Increasing Data and add regularization	Concerns: Overfitting Plan: Increasing Data for each class
Ethical Concerns *Definition*	Concerns: People looking younger Plan: Cluster and remove outliers	Concerns: Women in hijab might be predicted as males. Plan: Increase the variety in data and look for more key features.

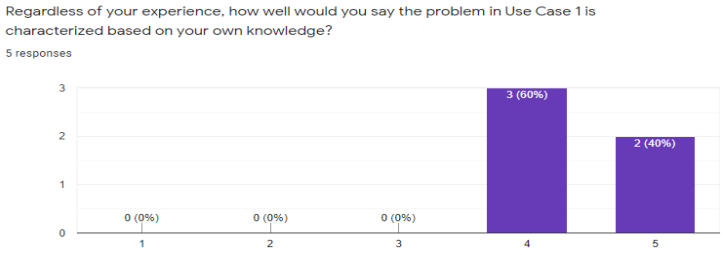
Feedback Thus Far

Illustrative Verbatim Quotes

"It is the future of marketing , just like in movies about the future where products are personalized and showed personally to people "

"It would be great to help people pick up the products that best suite them"

Illustrative Visualization



Proposed Next Steps

- Train the models and test them through a software engineering loop.
- Enhance recommendation system to adapt all features

Proposed Timeline

Month 1

- Trained Gender Model
- Simple prototype of gender classification

Month 2

- Fully tested gender classifier
- Recommender prototype
- Age Recognizer

Month 3

- Final Deliverable