

*Artificial Intelligence and Data Engineering*

*Industrial* *Applications*

***CarVibes***

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Project specifications

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# Functionalities

**User profile**

If no information can be obtained from other applications, a form compiled by hand is used to get the information. This information is used to reproduce a personalized experience.

* Acquire information about other applications:

Places: Booking

* + - get visited places in the last 3 years
* Defined by hand by compiling a form:
  + Sceneries (classical sceneries) that the user can choice:
    - Beach (Bermuda)
    - Mountain (Swiss Alps)
    - Highway (Calla Lily Valley)
    - Touristic city (Rome)

The user profile contains some information like his categories of places (mountain, beach, city), necessary for the guide simulation, and all the information related to the user’s feelings detected, updated at each guide simulation, related to a specific car.

Different kind of ambient sounds, scents, weather and lights are associated to the different categories of places. The following scents, ambient sounds, weather and lights have been considered for the principal places categories:

* + Scents (Google study)
    - Peaches (Beach)
    - Lavender (City)
    - Cloves (Mountain)
    - Mushrooms (Forest)
  + Music genres or ambient sounds (Alexa sounds)
    - Sea waves (Beach)
    - Birds chirping (Mountain)
    - Traffic (City)
    - Forest sounds (Forest)
  + Weather of the video (associated to the place)
    - Sunny (Beach, Forest, City)
    - Snowy (Mountain)
  + Lights (associated to the place and the weather)

At the start, only the information provided by the form or by the other application are present into the profile. This information is updated after the guide simulation experiences.

**Driving Experience**

The main goal is the detection of the facial emotion during the driving experience for **Comparison** and **Suggestion.**

If it is the first experience, the following steps are performed:

* + Get user profile information saved into application (this information used to recreate a personalized experience)
  + The places provided during the registration phase and the associated weather, light colour, scent and ambient sound are used

During the simulation:

* + Show simulations of the defined profile through on-window 360° videos
  + The user can request different scenarios and different weather of the video thanks to a speech recognition system
  + User’s feelings are collected

For each user there is a rank of favourite places and weather and the emotions detected during each driving experience (related to a specific car).

After the simulation:

* + If a simulation obtains at least the 60% of positive emotions, the place and the weather score is updated.
  + Save score information.
  + Compute a score for each car tested basing on the user emotions:
    - Happiness
    - Surprise
  + Suggest the car with the highest score computed considering the average score of the different simulations (weighted according to the duration of the simulation) for the same car.
  + Show a comparison of percentage of positive emotions and of the different data sheets for each car.
  + The score of a specific car is updated basing on the average score of its simulations

During the following driving experience, the simulations related to the favourite places are reproduced, in order of preference.

# Characteristics

* Reliability : the application guarantees and accuracy of at least 90% on emotion recognition
* Accessibility : the application must always be accessible by all the users
* Privacy : the application must guarantee the privacy of all the users
* Performance: the application must guarantee a fast detection of the user mood and ability to detect changes of the mood

# Constraints

* Accuracy higher than 85% recognizing positive emotions
* The experience only fits one person
* Recognition of both positive and negative emotions
* Sequential simulations that require different scents needs a period of air cleaning to neutralize the smell
* Required internet connection
* Classic seats disposition required