Emoji-face-keyboard

Team 4

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Emoji

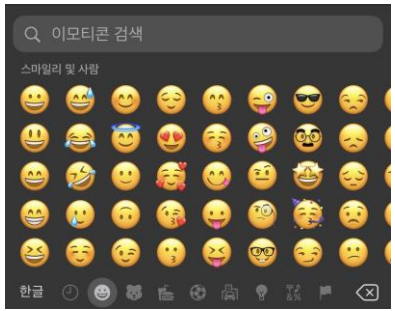
- Language for everyone in the digital world.
- Designed to add emotional nuance to otherwise flat text.
- In terms of human behavior and context sensing, emoji helps represent “internal state - emotion”.

Target users and the problem

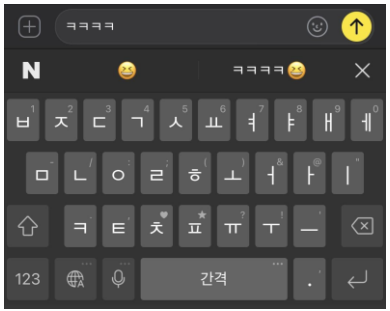
- Target users
  - Young people who want to send emoji in quick & intuitive way.
  - Elderly people who have problems finding emoji they want.

- Problem
  - It is hard and inconvenient to find specific emoji from the list.
  - Finding emoji with keyword is annoying, especially for face emojis.

Existing solutions and their limitations



iOS keyboard

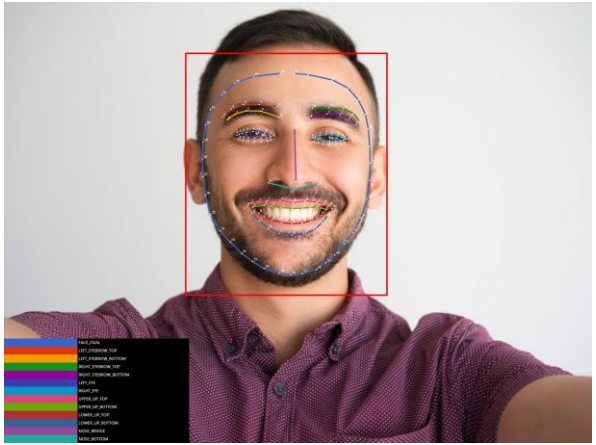


Naver keyboard

Three existing emoji interfaces

1. Finding emoji from the list of grid.
2. Searching emoji with keywords.
3. Recommendation through text context recognition

The key solution idea to tackle the problem



- Using facial recognition with front camera, emoji-keyboard recommends appropriate emoji.
- People can select desired emoji accurately and intuitively, without scrolling lists or searching with keyword.

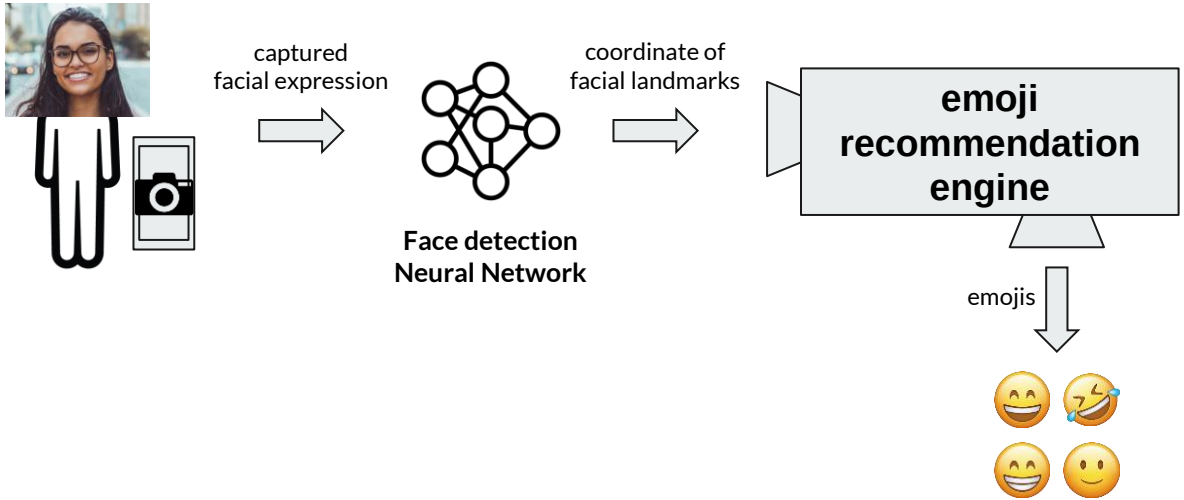
Usage scenarios - 1

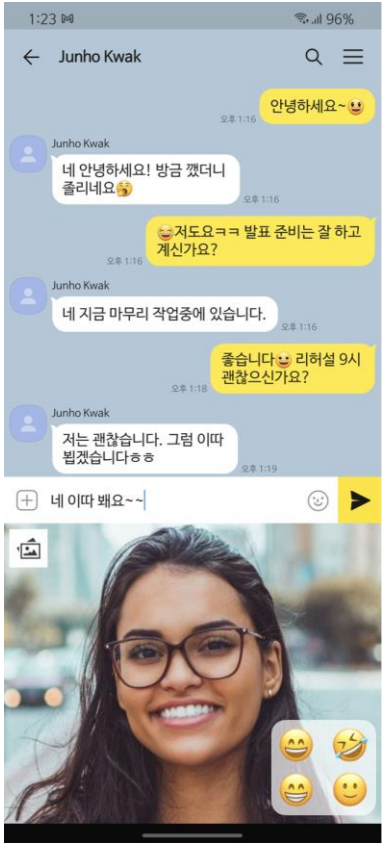
1. James is going home, carrying baggage in his right hand.
2. He got an invitation message from his friend, and wants to respond with an smiling emoji to express his emotion.
3. He smiles to camera, and emoji-face-keyboard recommends him several smiling emojis.
4. He picks one of emoji from the list, using only his left hand.

Usage scenarios - 2

1. Today is James' birthday. James is going to take a photo of his birthday party and post it on SNS.
2. He wants to decorate his picture with emojis that show his happy emotion.
3. He smiles to camera, and emoji-face-keyboard recommends him several smiling emojis.
4. He picks emojis from the list and decorates his picture nicely.

System overview



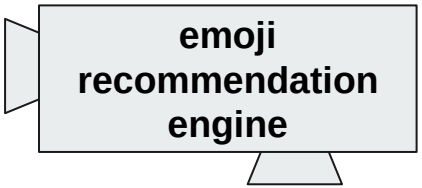


System overview (additional feature)

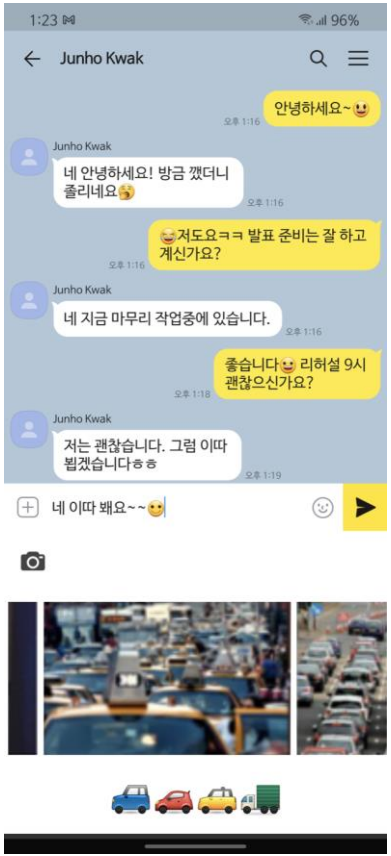
picture from gallery

Object detection Neural Network

detected objects



emojis



Expected challenges and solutions

Challenges/Solutions

1. It is hard to recommend emoji only by facial expressions - There are too many emojis.
   We need additional interface that allows users to use several emojis.
2. Facial expressions vary by people.
   Calibration is needed to support personalization.
3. Mapping landmark to emojis is challenging.
   We need to find effective way to solve it.
4. It should be a application that replaces the existing keyboard.
   Basic keyboard functions should also be implemented to work well.

Evaluation strategy

- **Accuracy** - Is recommended emoji fit with user's intentions?
  - Ask the user to make a specific facial expression, and check if the recommendation matches.
- **Latency** - Is recommendation fast enough?
  - Measure how long it takes to recommend emoji.

Overall project plan

	2021. 9. 27	2021. 9. 28	2021. 9. 29	2021. 9. 30	2021. 10. 1	2021. 10. 2	2021. 10. 3	2021. 10. 4	2021. 10. 5	2021. 10. 6	2021. 10. 7
곽준호 김선준	Setting for Android development		Study Android Camera2/CameraX API				Display captured camera view at app screen				
박지호 박종석	Decide UI/UX design for key board			Setting for Android development. Figuring out how to implement our app							

	2021. 10. 8	2021. 10. 9	2021. 10. 10	2021. 10. 11	2021. 10. 12	2021. 10. 13	2021. 10. 14	2021. 10. 15	2021. 10. 16	2021. 10. 17	2021. 10. 18
	Get individual frames from captured video						Pre-process frames before feeding them to neural network				
	Figure out how to display captured camera view on keyboard area										

	2021. 10. 19	2021. 10. 20	2021. 10. 21	2021. 10. 22	2021. 10. 23	2021. 10. 24	2021. 10. 25	2021. 10. 26	2021. 10. 27	2021. 10. 28	2021. 10. 29
	Run face detection model with real time video input										
	Put input layout overlayed on camera screen and integrate it with input on other apps Implement basic keyboard functions										

	2021. 10. 30	2021. 10. 31	2021. 11. 1	2021. 11. 2	2021. 11. 3	2021. 11. 4	2021. 11. 5	2021. 11. 6	2021. 11. 7	2021. 11. 8	2021. 11. 9
	Analyze face detection output results & Display them in human readable form					Integrate with keyboard interface				Project Progress review and demonstration	Team self-inspection
	Implement basic keyboard functions		Test App. Function, Performance, UX			Integrate with machine learning functions.					

Overall project plan

	2021. 11. 10	2021. 11. 11	2021. 11. 12	2021. 11. 13	2021. 11. 14	2021. 11. 15	2021. 11. 16	2021. 11. 17	2021. 11. 18	2021. 11. 19	2021. 11. 20
곽준호 김선준	Research academic articles regarding relationship between facial landmarks & emotion						Implement prototype of emoji recommendation				
박지호 박종석	Improving accuracy of turning facial expressions into emoji and challenging additional objecet recognition										
	2021. 11. 21	2021. 11. 22	2021. 11. 23	2021. 11. 24	2021. 11. 25	2021. 11. 26	2021. 11. 27	2021. 11. 28	2021. 11. 29	2021. 11. 30	2021. 12. 1
	Cont.							Implement personalization through minimum calibration			
	Additional feature : select target image from gallery							Design UI/UX for "emoji recommendation with gallery image" situation			
	2021. 12. 2	2021. 12. 3	2021. 12. 4	2021. 12. 5	2021. 12. 6	2021. 12. 7	2021. 12. 8	2021. 12. 9	2021. 12. 10	2021. 12. 11	2021. 12. 12
	Cont.					Final app building and prepare presentation					
	Additional feature : recommend emoji through object detection with rear camera										

Final deliverable and success criteria

- Accuracy
  - Intended emoji should be recommended with 80% of accuracy.
- Latency
  - Recommendation should be done in 1 second.
- UI/UX
  - It should be intuitive to use.