FACEMOJI

TEAM4
곽준호 김선준 박지호 박종석

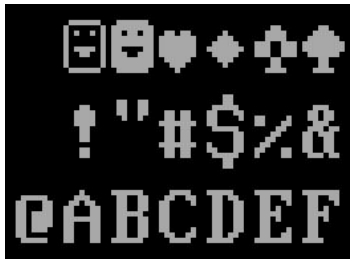
Project Idea

image source : unsplash.com

(^_^) (^^) (^-^) ^^	미소짓는 모습	(^o^)	웃는 모습
(^_^;	겸연쩍어하는 모습	(*_*) ('o')	놀란 모습
(;_;) (T_T)	우는 모습	(@_@)	눈이 뱅글뱅글 도는 모습
^^* (^^* ^^// ^///^ -///- -_- \\^w^//	부끄러워하는 모습	(-_-) (——)	눈을 가늘게 뜨고 불만을 표시하는 모습
=^.^=	고양이	U•ㅛ•U	개
◀<:=	오징어	○::=	문어
/^o^\	후지산 (옷는 모습의 변형)	_()_	합장 (손모아 인사하는 모양)

ㅠ_ㅠ ㅜ_ㅜ ㅜ.ㅜ ㅠㅠ ㅜㅜ ;ㅅ; ㅜ—ㅜ ㅠㅇㅠ ㅠㅅㅠ	우는 모습	ㅇㅅㅇ ㅇㅁㅇ ㅁㅅㅁ ㄴㅇㄱ	놀란 모습
-_-^	한쪽 눈썹 치켜세우기	@_@	뱅글뱅글
^-^;;;;;	땀을 흘리는모습	^^ ㅅㅅ ㅆ	눈 웃음
——	모음'ㅡ'를 이용한 삐진모습	ㅇㅠㅇ	토하기 또는 침흘리기
^_^< ^^7 ^-^7 ^_^7	충성하는 모습		

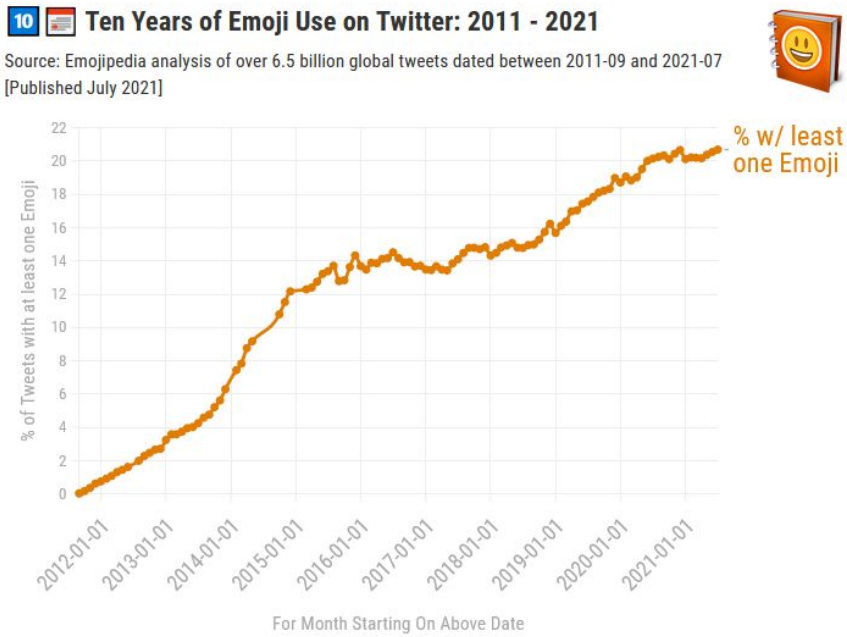
:-) :) =)	미소짓는 모습	:-(:( )-:	슬픈 모습
:'-(;-(	우는 모습	:/	불만에 찬 모습
:|	말을 안 하는 모습	:-D :D	웃는 모습
:-P :p	메롱	;-) ;) (-;	윙크짓는 모습
B-) 8-)	선글라스 낀 모습, 안경 쓴 모습	:-O :O	놀란 모습
XD	배꼽을 잡고 웃는 모습	:V	입을 크게 벌린 모습
<3	하트		



reference : wikipedia

SMILEYS & PEOPLE

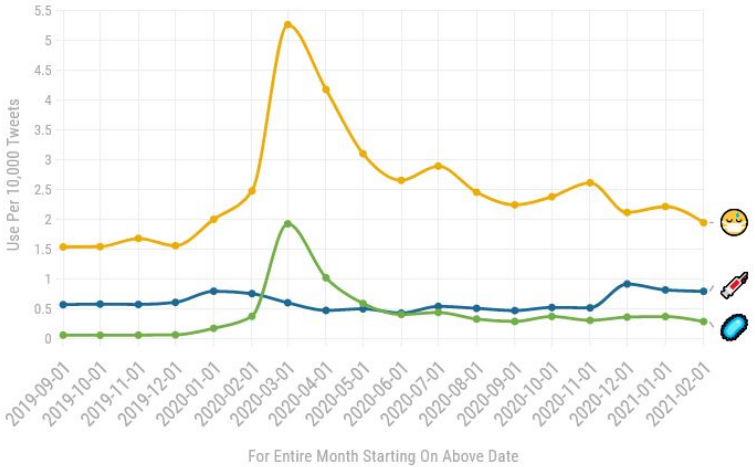
- 92% of the online population uses emoji daily.
- Emojis are processed by the brain as non-verbal information.
- Comments and shares in SNS increase by 33% when emojis are present.



Reference : https://blog.emojipedia.org/emoji-use-at-all-time-high.

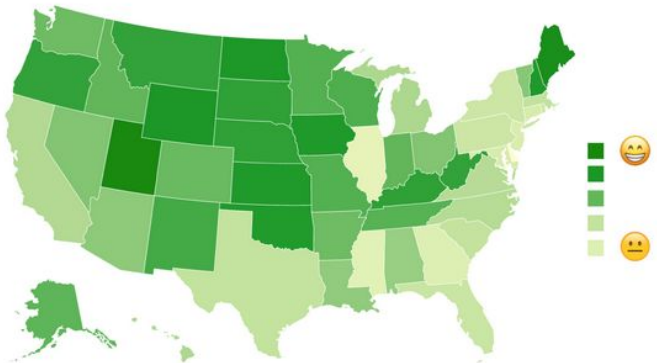
Usage of the COVID-19 Related Emoji on Twitter

Source: Emojipedia analysis of 976.7 million tweets dated between 2019-09-01 and 2021-02-25. [Published March 2021]



Utah is the happiest place in 🇺🇸, according to emojis

The image below reveals the states with the highest percentage of positive emojis in their tweets:



Reference : https://blog.emojipedia.org/one-year-on-bored-of-the-pandemic/

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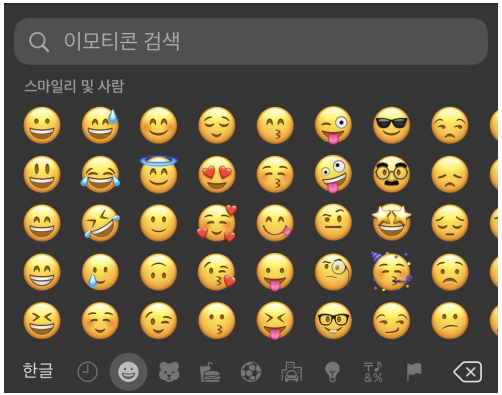
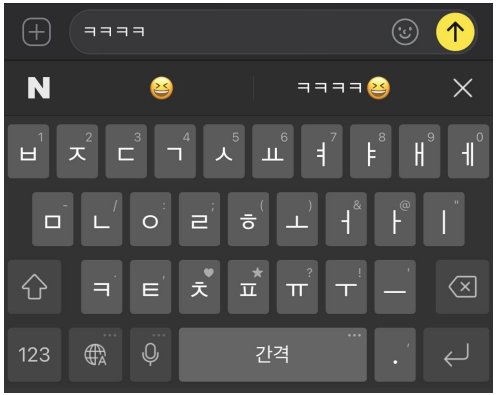
But...

poor, naive, primitive, boring interface





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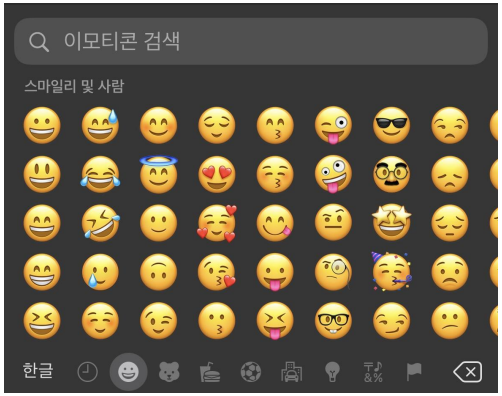
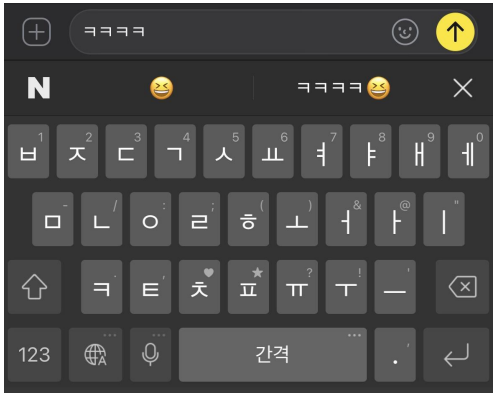


need to know

the name of emoji

in advance



limited emotions

&

limited emojis

But...

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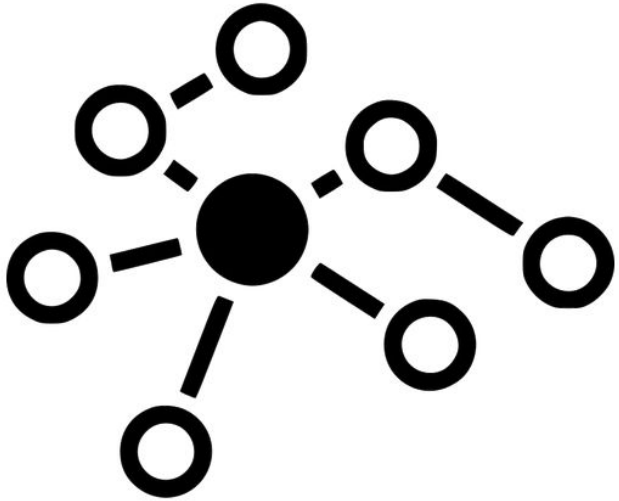
limited emojis

Key Components of Our Approach

- ML based Face Detection
- Graph Structured Emoji Classification



Target Users

1. Creature of Habits
2. Emotionally-Drained
3. Elderly
4. Young

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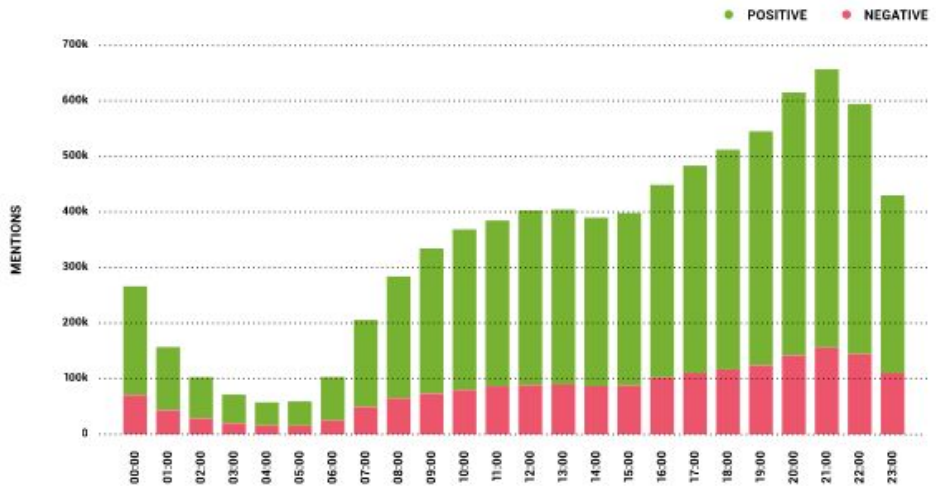

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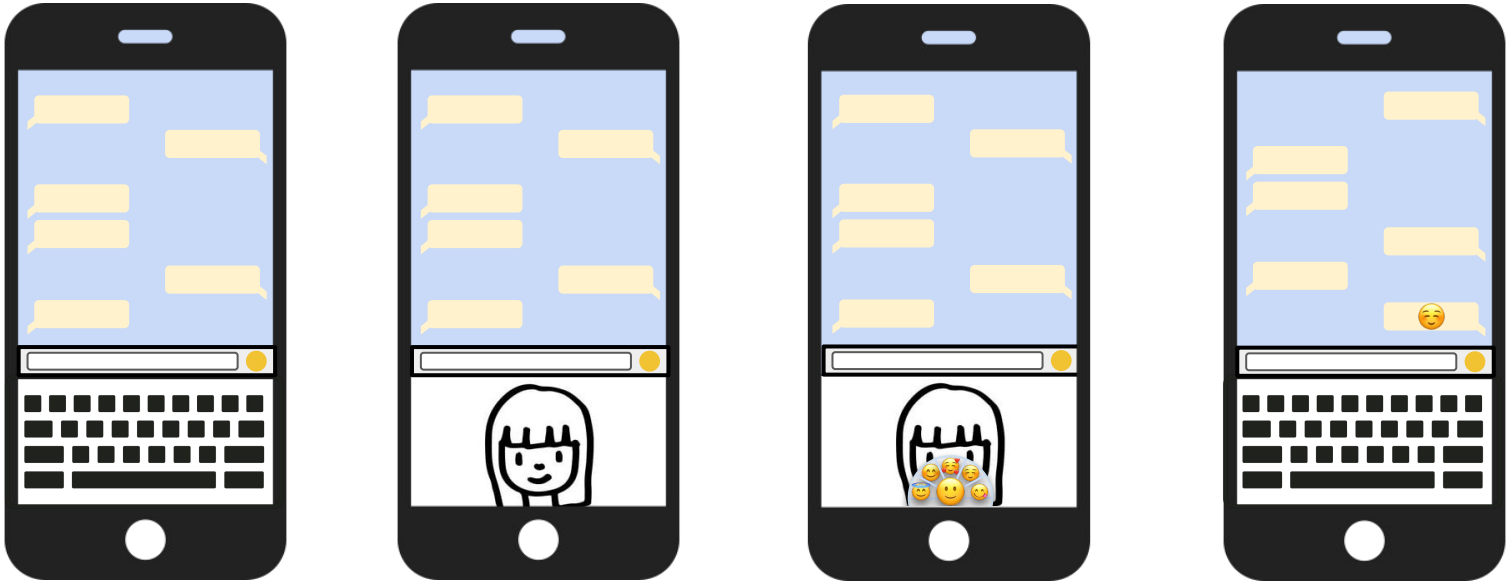
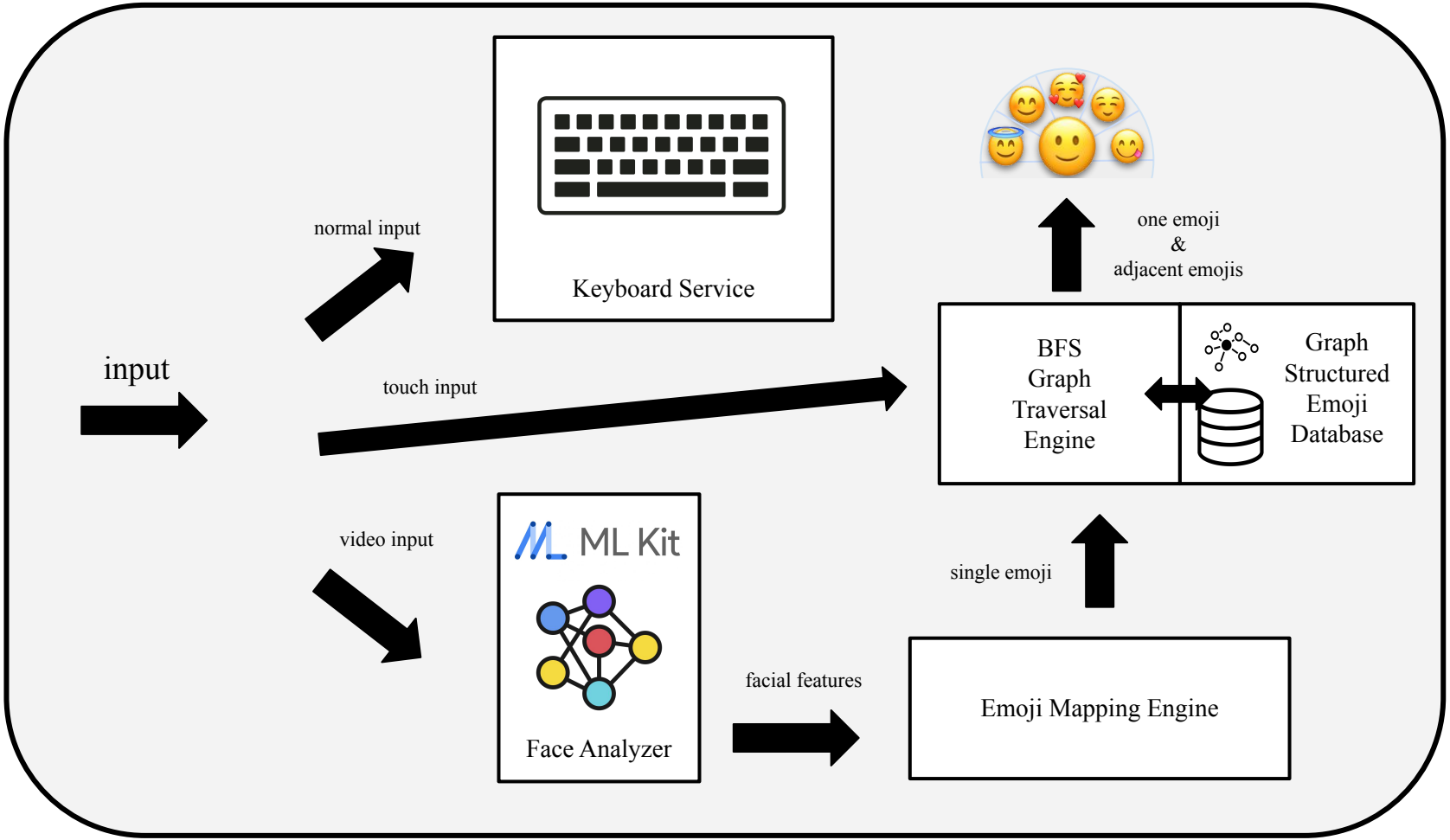
Demo

Demo

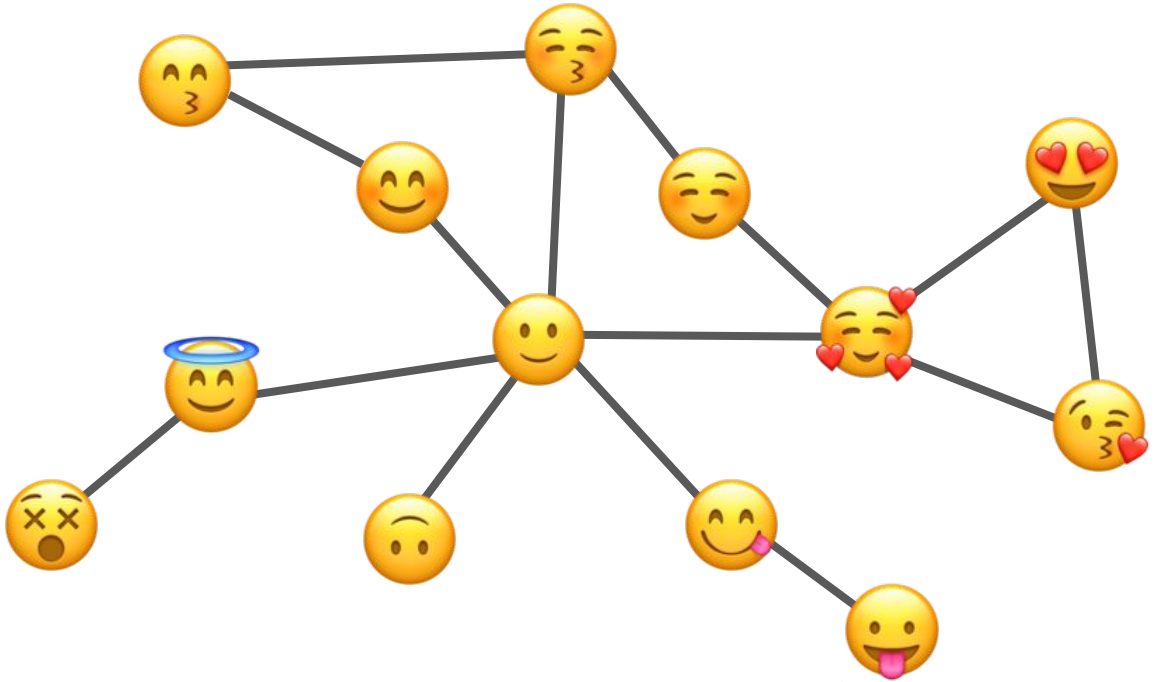
- Basic Keyboard, with Camera Feature Integrated.
- Analyzing Real Time Video and Extract Facial Information

System Architecture Overview




input
normal input
Keyboard Service
touch input
video input
ML Kit
Face Analyzer
facial features
Emoji Mapping Engine
single emoji
BFS
Graph
Traversal
Engine
Graph
Structured
Emoji
Database
one emoji
&
adjacent emojis

emoji graph would be like...



Key Technical Challenges & Solutions

Challenge & Solution

- Challenge

  As Hangul letter is combination of consonants and vowels, naïve implementation of keyboard makes Hangeul output separated, such as “안녕” into “ㅇㅏㄴㄴㅕㅇ”.

- Solution

  We designed 4-states automata. Each state represents initial state, 초성이 들어온 상태, 중성이 들어온 상태, and 종성이 들어온 상태. This states enable proper processing of consonants and vowels in Hangul.

Challenge & Solution

- Challenge

  With a class which inherits AppCompatActivity, it is impossible to make a keyboard application that is usable in other applications.

- Solution

  We made an application as a service form. We defined a class which inherits InputMethodService, and processed keyboard input with currentInputConnection object.

Challenge & Solution

- Challenge

  KeyboardCamera class is not a context and does not have a lifecycle, which does not fit with CameraX api.

- Solution

  We made KeyboardCamera class include a ‘service’ to have a class, and inherit LifecycleOwner interface to have a lifecycle.

Challenge & Solution

- Challenge

  It is difficult to keep the text erased by pressing and holding the backspace button.

- Solution

  We added onTouchListener, and made action_down event to keep erasing the text. In order to add feedback to the backspace button, we had to modify isPressed property of the view programmatically.

Challenge & Solution

- Challenge

  It is impossible to pass face information to FaceContourOverlay in FaceAnalyzer class, which is necessary to display face to screen.

- Solution

  We made an abstract interface in FaceAnalyzer class. Then, we added createFaceDetector function which returns FaceAnalyzer instance, and passed face information with implementing abstract interface.

Challenges to be Addressed

- Mapping face detection results to single emoji.
- Make graph of emojis with respect to their similarity in meaning & context.

Project Schedule

Timeline

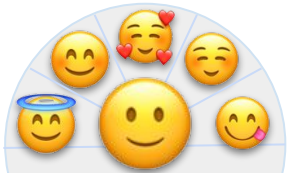
	2021. 11. 10	2021. 11. 11	2021. 11. 12	2021. 11. 13	2021. 11. 14	2021. 11. 15	2021. 11. 16	2021. 11. 17	2021. 11. 18	2021. 11. 19	2021. 11. 20
곽준호 김선준	Research academic articles regarding relationship between facial landmarks & emotion						Implement prototype of emoji recommendation				
박지호 박종석	Make graphs of emoji										

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			
Implement UI for BFS emoji graph traversal										

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					
Cont.										

Final Deliverable

Final Deliverable



- A Keyboard app with novel emoji interface.
- The interface first receives video input of face.
- Then it recommends corresponding emoji, with several similar emojis.
- User can select specific emoji, and choose whether to
  - continue traverse from that emoji
  - or type that emoji
- User can personalize recommendation engine.

Success Criteria

Success Criteria

- Accuracy
  - Intended emoji should be recommended with 80% accuracy.
  - Searching specific emoji in mind should be done in at most three step.
- Latency
  - Face detection should be done in 1 second.
  - Latency of processes other than face detection should be negligible.
- UI/UX
  - Graph traversal should be done in intuitive manner.

Questions?