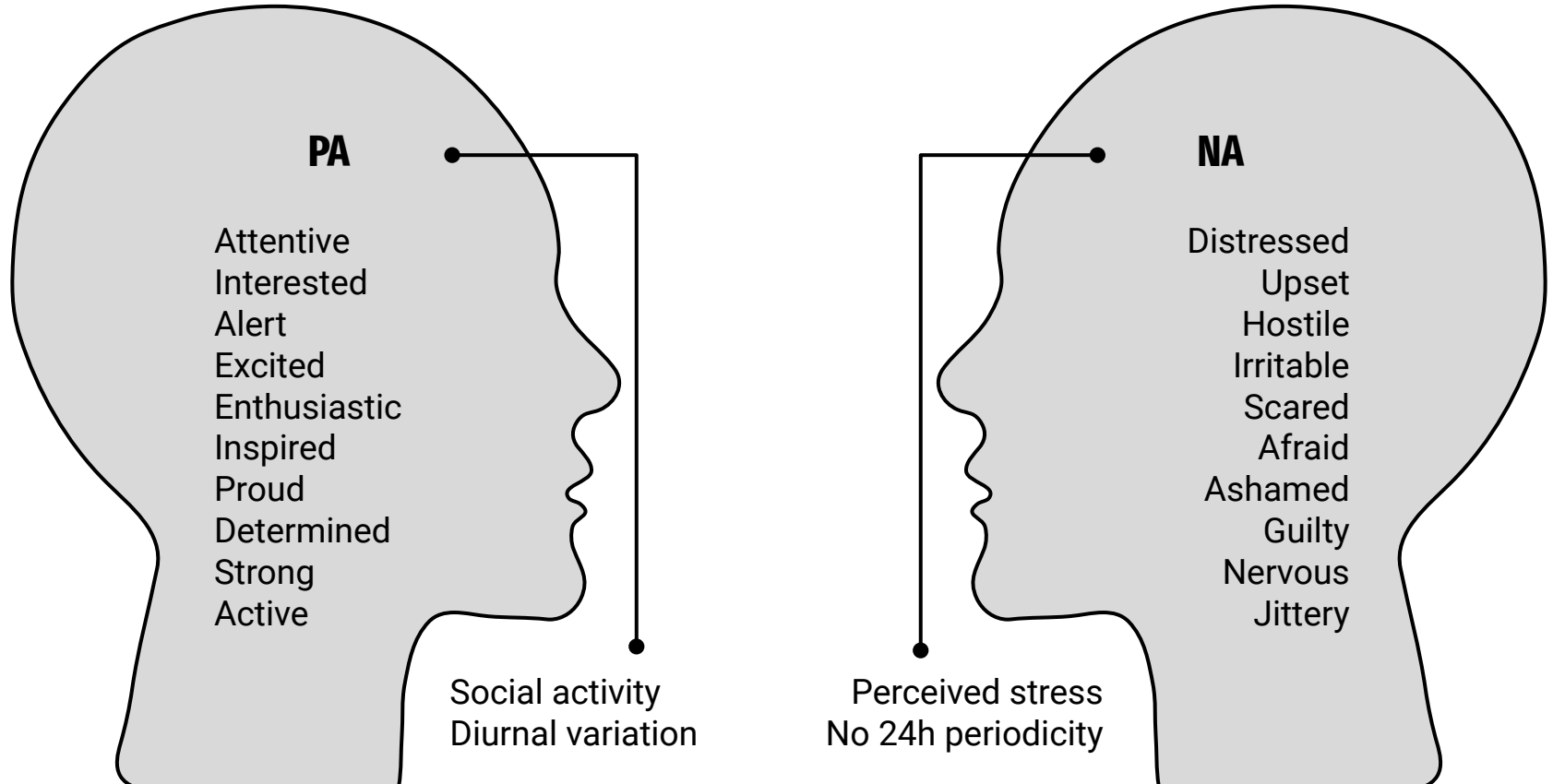


# Emotions

**Methods to bring the human  
in the loop**

# PANAS Positive Affect and Negative Affect Scales



# PANAS Positive Affect and Negative Affect Scales

**High**  
↑  
high energy  
full concentration  
pleasurable engagement

**PA** extraversion

↓  
**Low**  
sadness  
lethargy

Not opposing  
mood factors!



distress  
hostility **High**

neuroticism

**NA**

↓  
calmness  
serenity **Low**

# PANAS

## Positive Affect and Negative Affect Scales

1  
very slightly  
or not at all

2  
a little

3  
moderately

4  
quite a bit

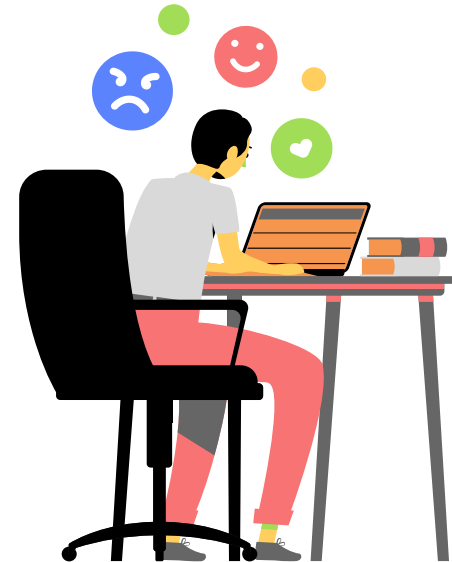
5  
extremely

- \_\_\_\_\_ interested
- \_\_\_\_\_ distressed
- \_\_\_\_\_ excited
- \_\_\_\_\_ upset
- \_\_\_\_\_ strong
- \_\_\_\_\_ guilty
- \_\_\_\_\_ scared
- \_\_\_\_\_ hostile
- \_\_\_\_\_ enthusiastic
- \_\_\_\_\_ proud

- \_\_\_\_\_ irritable
- \_\_\_\_\_ alert
- \_\_\_\_\_ ashamed
- \_\_\_\_\_ inspired
- \_\_\_\_\_ nervous
- \_\_\_\_\_ determined
- \_\_\_\_\_ attentive
- \_\_\_\_\_ jittery
- \_\_\_\_\_ active
- \_\_\_\_\_ afraid

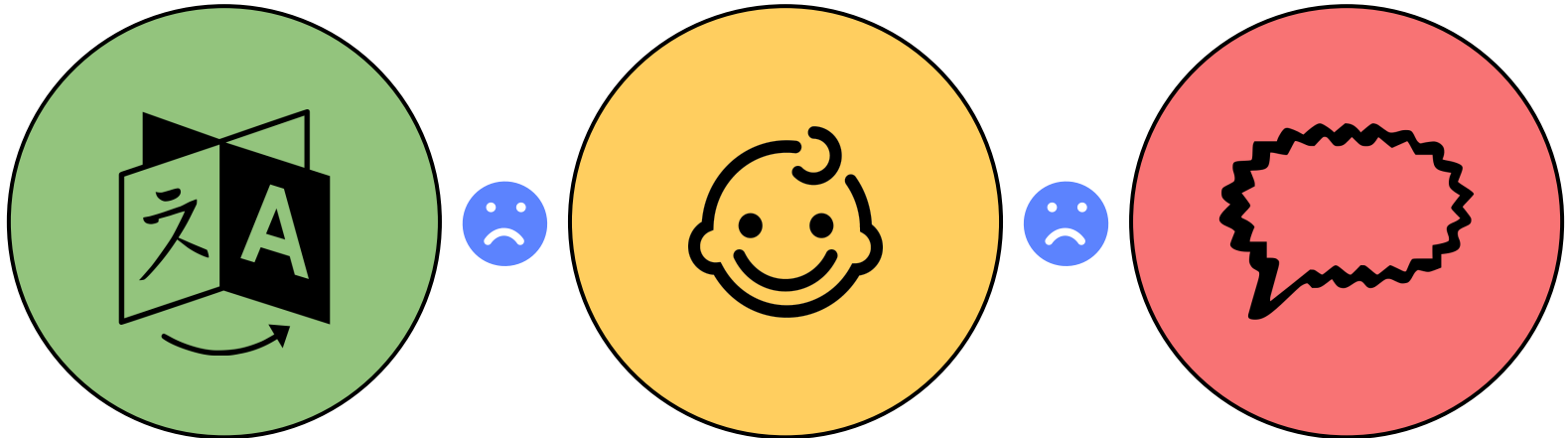
We have used PANAS with the following time instructions:

- Moment (you feel this way right now, that is, at the present moment)
- Today (you have felt this way today)
- Past few days (you have felt this way during the past few days)
- Week (you have felt this way during the past week)
- Past few weeks (you have felt this way during the past few weeks)
- Year (you have felt this way during the past year)
- General (you generally feel this way, that is, how you feel on the average)



# PANAS Positive Affect and Negative Affect Scales

- Brief
- Reliable
- Precise
- Internally Consistent
- Stable
- Largely independent measures of PA and NA
- Regardless of time frame



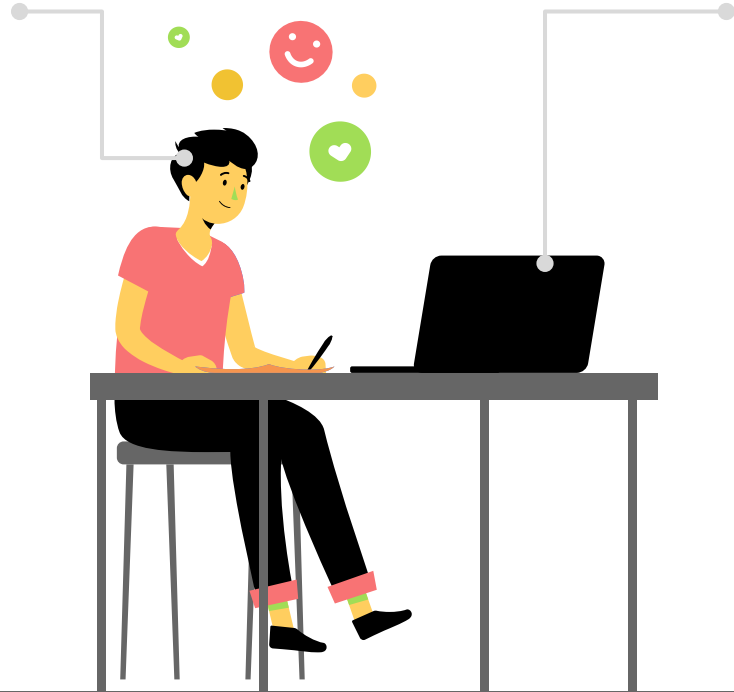
# SAM Self Assessment Manikin

## Affective Reaction

Pleasure

Arousal

Dominance



## Emotional Stimuli

Words

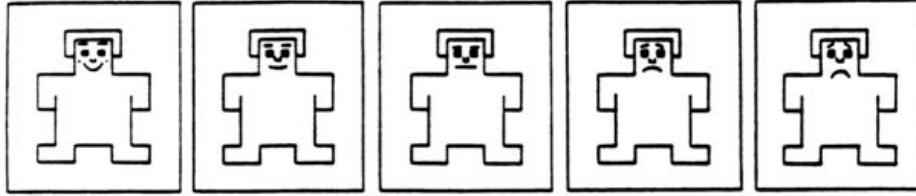
Objects

Events

# SAM

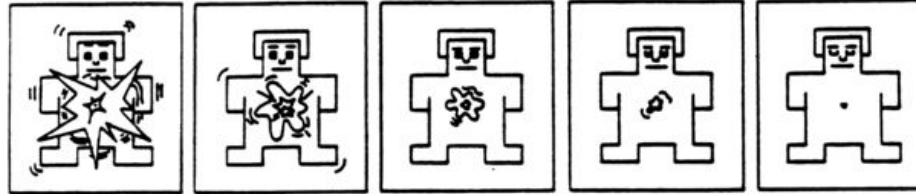
## Self Assessment Manikin

Happy



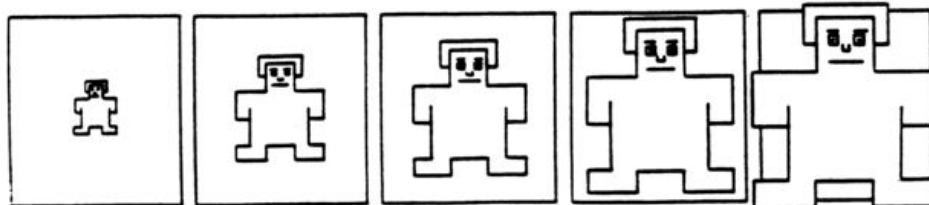
Unhappy

Excited



Calm

Controlled



In Control

# SAM Self Assessment Manikin



withdraw  
escape ← **Pleasure** → approach  
tendency to approach stimulus

stimulus intensity  
decreases ← **Arousal** → stimulus intensity  
increases  
active strength of mind of a behaviour choice

controlled ← **Dominance** → in control  
feeling of control between the subject and the stimulating object



# PANAS

- Brief
- Reliable
- Precise
- Internally Consistent
- Stable
- Largely independent measures of PA and NA
- Regardless of time frame
- Used jointly with other measures

# SAM

- **Nonverbal**
- More accurate results on feelings of control
- Easy
- Effective
- Quick
- Assess changes through time
- Shape of the affective space
- Simple assessment or more complex cases

# EmotionKit

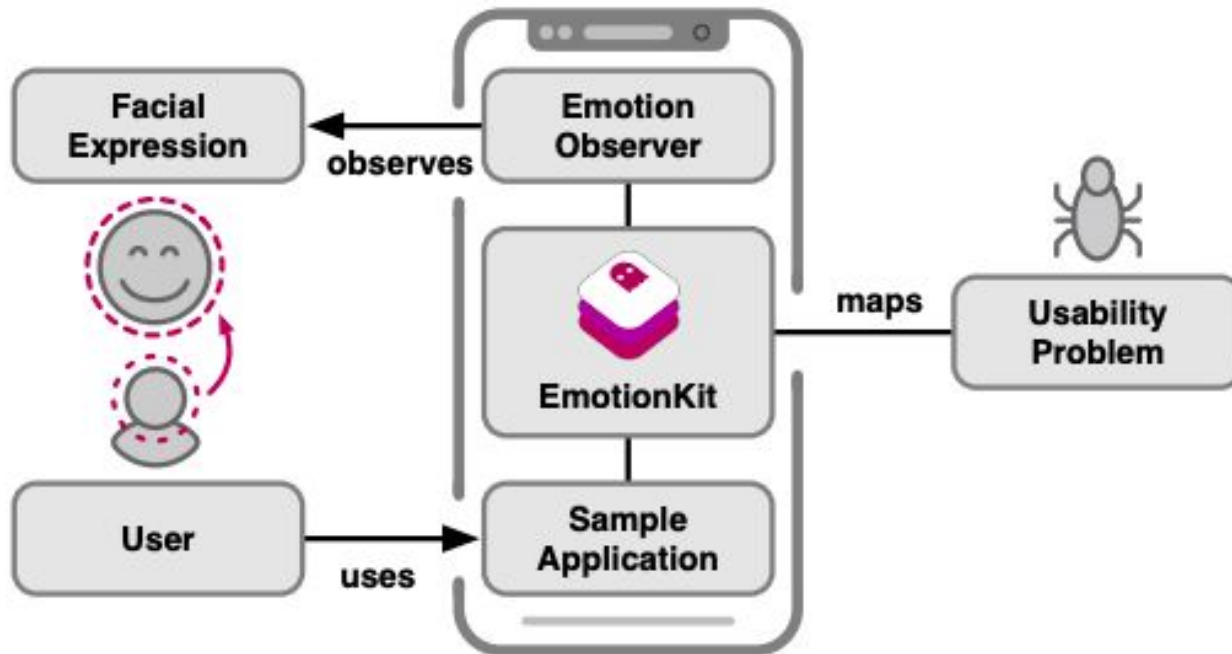


**Facial Expression**



**Analysis and Matching  
with emotions**

# EmotionKit



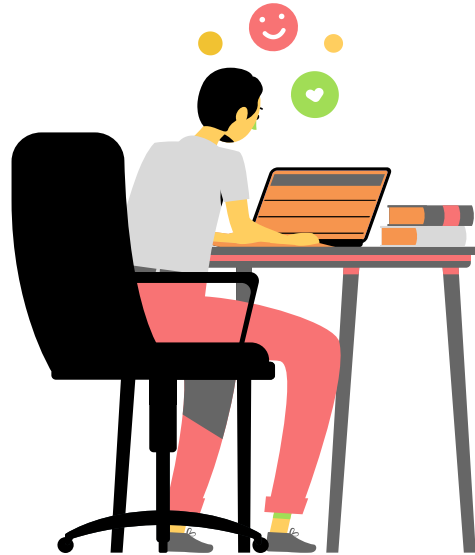
# EmotionKit

#	U1-C	U1-I	U2-C	U2-I	U3-C	U3-I	U4-C	U4-I	U5-C	U5-I	U6-C	U6-I
1	TP	TP	TN	FP	TP	TP	FP	TN	ERR	TP	FP	ERR
2	TP	TN	TN	TN	TP	TP	TN	TP	FP	TP	FP	TP
3	FP	TN	TN	TN	ERR	FP	TP	TP	FP	TP	TN	FP
4	TN	TP	TN	FP	TN	TP	TN	FP	TN	TP	TN	ERR
5	TN	FP	FP	FP	TN	TP	TP	FP	FP	FP	TN	TP
6	TN	FP	TN	FP	TN	TP	TN	FP	TN	FP	TN	TN
7	TN	TP	FP	TN	TN	TN	TP	TP	TN	TP	TN	TN
8	TN	FP	TN	FP	TP	FP	FP	TP	FP	TP	FP	TP
9	TP	TP	TN	TP	TP	TP	TN	TP	TN	TP	TP	TP
10	TP	TN	TN	ERR	TP	FN	TP	TN	FP	ERR	FP	ERR
11	ERR	FP	TP	TN	ERR	TP	TN	TN	TN	TP	TP	TP
12	TN	FP	TN	FP	TN	FP	TN	FP	TN	TP	TN	TP

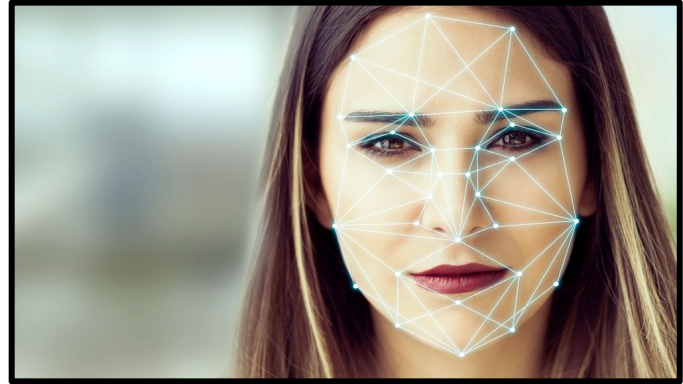
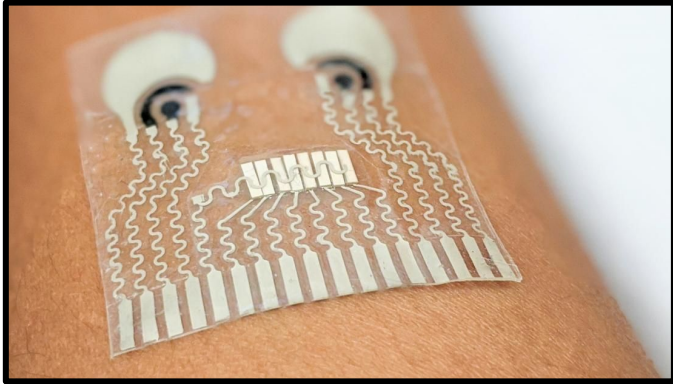
- Done continuously
- No effort for the user
- Precise (74%)
  
- Requires extra computational power
- Could infringe user's privacy
- Could lead to even more monitoring of users and collection of private information

# Design of Interfaces

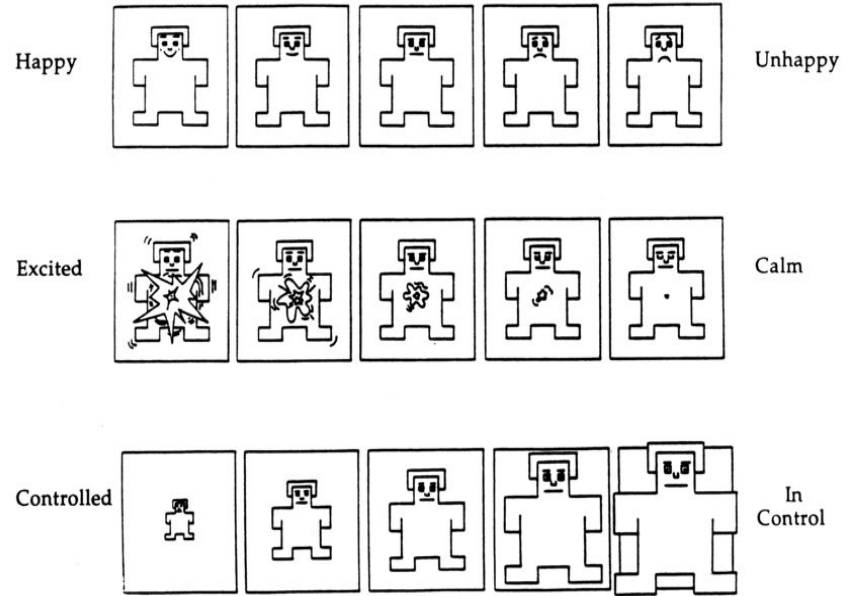
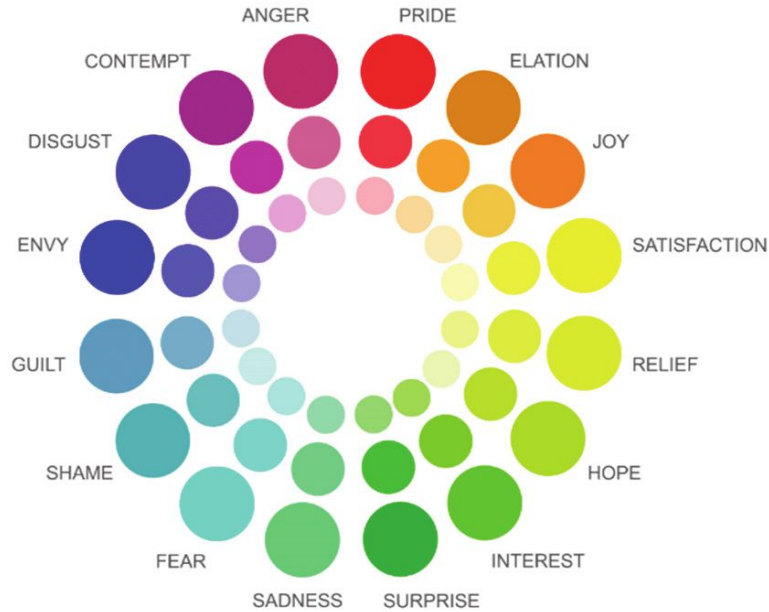
→ An example of how to apply these methods and scales to the design of interfaces



# Design of Interfaces



# Design of Interfaces



# Sources

- Watson, D., Clark, L. A., & Tellegen, A. (1988). **Development and validation of brief measures of positive and negative affect: the PANAS scales.** *Journal of personality and social psychology*, 54(6), 1063.
- Bradley, M. M., & Lang, P. J. (1994). **Measuring emotion: the self-assessment manikin and the semantic differential.** *Journal of behavior therapy and experimental psychiatry*, 25(1), 49-59.
- Johanssen, J. O., Bernius, J. P., & Bruegge, B. (2019, May). **Toward usability problem identification based on user emotions derived from facial expressions.** In 2019 IEEE/ACM 4th International Workshop on Emotion Awareness in Software Engineering (SEmotion) (pp. 1-7). IEEE.
- Lockner, Damien & Bonnardel, Nathalie. (2014). **Emotion and Interface Design How to measure interface design emotional effect?** Keer 2014 International Conference on Kansei Engineering and Emotion Research

**We hope you liked it !**



**Feel free to ask questions**