Sensing Emotions in Text Messages: An Application and Deployment Study of EmotionPush

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Introduction

EmotionPush

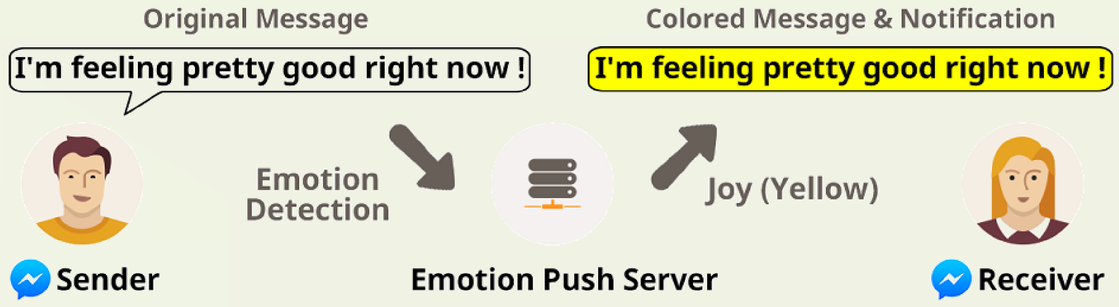
- A system that displays colored icons on push notifications to signal emotions conveyed in received messages.
- Powered by machine learning technologies with state-of-the-art performances and built on top of the long-lasting development of emotion detection.

EmotionPush is available at

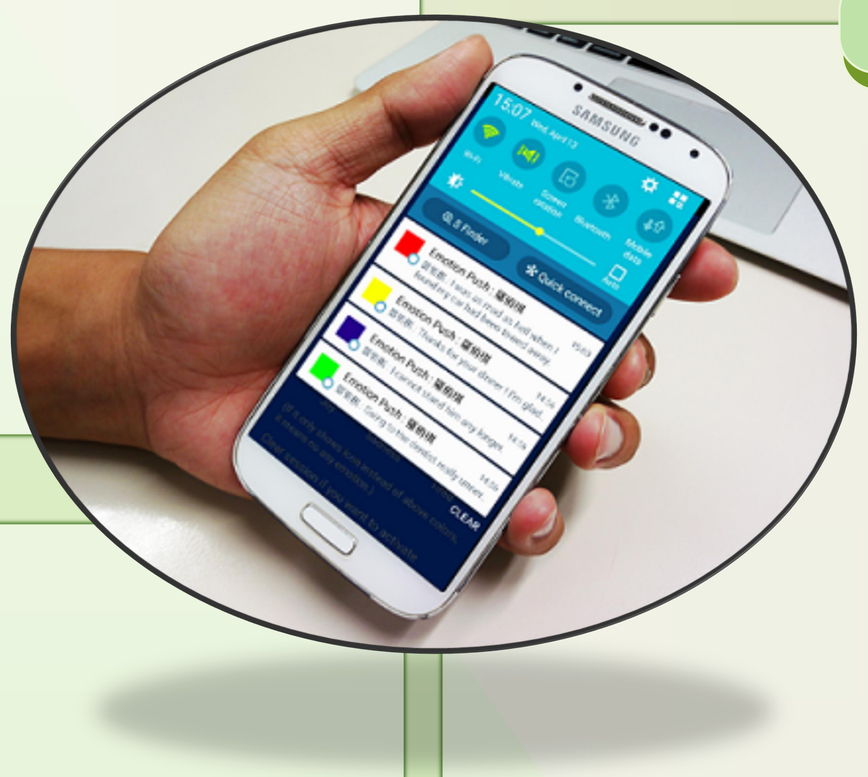
Chinese Version.

English Version.

Interface and Architecture

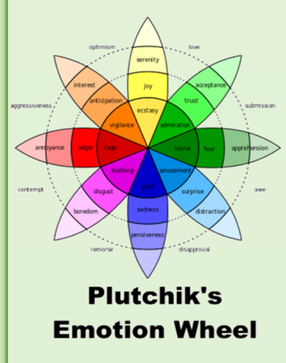


System



Visualizing Emotions

- EmotionPush applies a categorical representation of emotions.
- The 7 main emotions were compacted from the LJ40K 40 emotions.
- The colors were assigned according to the Plutchik's Emotion Wheel color theme.

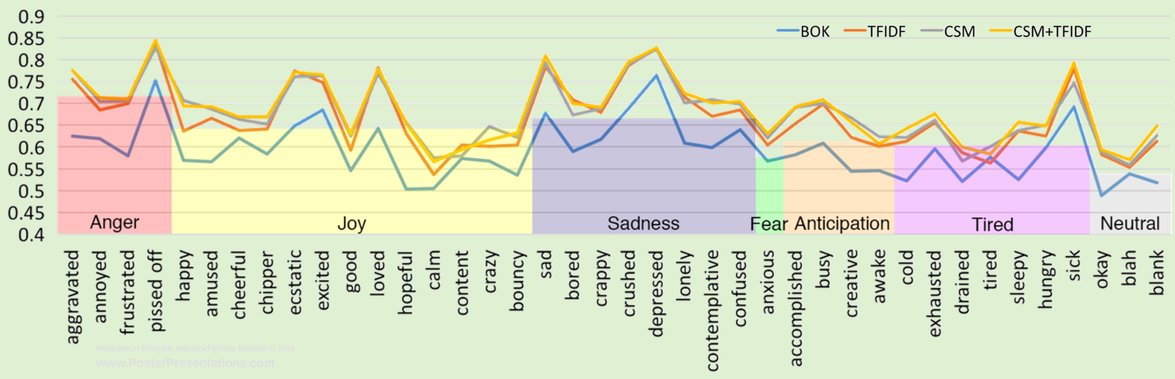


Plutchik's Emotion Wheel

Anger	Aggravated, Annoyed, Frustrated, Pissed off	Red	#F70A0A	(247, 10, 10)
Joy	Happy, Amused, Cheerful, Chipper, Ecstatic, Excited, Good, Loved, Hopeful, Calm, Content, Crazy, Bouncy	Yellow	#FFFF00	(255, 255, 0)
Sadness	Sad, Bored, Crappy, Crushed, Depressed, Lonely, Contemplative, Confused	Navy Blue	#281A7A	(40, 26, 122)
Fear	Anxious	Green	#00FF00	(0, 255, 0)
Anticipation	Accomplished, Busy, Creative, Awake	Orange	#FF9A17	(255, 154, 23)
Tired	Cold, Exhausted, Drained, Tired, Sleepy, Hungry, Sick	Purple	#D32BFC	(211, 43, 252)
Neutral	Okay, Blah, Blank	(No Color)		

Emotion Classification

- Represent each post by summing up the corresponding 300-dimensional word vectors trained on Google News.
- Designed as binary classifiers that indicates if the current message belongs to one of the 7 compacted emotions.
- Train on LJ40K corpus.



Deployment Study

Experiment Setup

To test whether **EmotionPush** can change the priority of interactions in instant messages on mobile devices.

- Recruited 8 native English speakers.
- Recorded their chat behavior for 12 days. We turned the color feedback off for the first 5 days and on for the latter 7 days.

Questionnaire

The user also required to fill up four questionnaires to reveal their opinions for **EmotionPush**.

- The Social Anxiety Interaction Scale (SIAS)
- The Internet Use (IU)
- The EmotionPush User Experience Survey (UX)
- The Conversation Quality Evaluation (CQE-14)
- **EmotionPush** can predict emotion colors correctly. (2.375 / 4)
- Wrongly predicted emotions would harm their chatting experience. (1.375 / 4)

Prioritize Interactions Analysis

After the emotion colors were pushed, user's behavior changed.

- *Joy* was read more slowly;
  Sadness and *Anger* was read more quickly.
- *Joy* was responded more quickly;
  Sadness and *Anger* was responded more slowly.