Emotion sensing using heterogeneous mobile phone data

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Background

1. Our vision and objectives
2. How you can contribute
3. Rewards for participation
4. Different levels of participation
5. Ethical approval
6. Data protection
7. How to be selected for participation
What is this study about?

- Do you ever wonder why and how your mood changes:
  - depending on the time of day
  - where you are
  - your workload
  - speed of internet connection
We want to understand...

- What elements of our physical and digital environment, and daily routines impact our moods
Lucky for us, PEOPLE

- People with smart devices carry hubs of information that we can use to ‘sense’ emotions

- How?
  - Capturing posts in Facebook, Twitter, Whatsapp, SMS texts
  - Labeling them with emotions
  - Correlating these labels with data on location and mobile phone usage patterns
Lucky for us, NEW YORK

- New York is a vibrant and dynamic environment
- The CUSP Urban Observatory is installing sensors to evaluate elements of city life (ex. noise pollution, population density etc.)
But, we can only do this with your help!

- We are looking to recruit 30-50 students at NYU to participate:
  - There are 2 levels of participation:
    - Full
    - Medium
Full Level Participation

- **Full level**: We will need access to your Twitter, Facebook and Whatsapp accounts (if applicable). We shall be collecting data for 3-4 months to analyse linguistic and usage patterns. We will need you to install two mobile phone apps, **DeviceAnalyser** and the **Android SMS collection application**.

- You will be assigned a numeric id and DeviceAnalyser will allow us to collect **anonymous information** (associated with the numeric id) about your phone usage e.g. how many texts you send, which wireless network you connect to and your location.

- Once a week, you will be asked to fill out a questionnaire developed to measure mental well-being (Warwick-Edinburgh Mental Well-being Scale).
Medium Level Participation

- **Medium level**: Same as full but without supplying SMS information (no *Whatsapp* or *Android SMS* collection)

- Please note that in order to participate, you need to be an Android phone user.

- You can choose to withdraw at any point during the data collection phase.

- The investigators of this study are committed to protecting your data and will not be disclosing any information to any third parties. We will be using it anonymously, for research purposes.
What will we be doing exactly?

- Labelling the Twitter, Facebook (and where applicable) SMS and Whatsapp text with emotion categories.

- Correlating this data with the phone usage data we collect using DeviceAnalyser. We will also be correlating this with your answers in the Warwick-Edinburgh questionnaire.

- The data collection phase will last approximately 3-4 months. We will also be looking at data 3-4 months prior to the study from your Twitter and Facebook accounts.
So what is the fuss about?

- We believe that the results from this study will help us:
  - Provide an effective, relatively non-invasive means for monitoring emotional fluctuation
  - Develop tools for personalized mental health management
  - Understand what types of interventions in cities may be beneficial in addressing environmental factors affecting people’s mood
Is there anything I should be worried about?

- You’ll be sharing your Facebook account details with the investigators of this study for 3-4 months.

- Sending us your texts as emails (only if you opt for full participation and choose not to use the automated setting) may cause discomfort.
What’s in it for me?

- $150-250 worth of Amazon vouchers, depending on the level of involvement (medium or full), upon completion of the data collection phase

- You will be obtaining a copy of any publication resulting from the study and if you wish to we can give you your own personalised results
I’m interested, what next?

- Read the **Participant information Leaflet** for the study and **complete the recruitment questionnaire**.

- If chosen for the study, we will get in touch with you and ask you to complete a consent form.

- Soon after we will be in touch about installing DeviceAnalyzer and the Android SMS Collection app as well as your Facebook, Twitter and Whatsapp account details.
Thank you for your attention!
DeviceAnalyzer is an Android App that collects phone usage statistics.

This data is stripped of personally identifying information as best as possible while preserving useful information.

Periodically the recorded data is uploaded to a server at the University of Cambridge. Only the PI of this study knows your identity.

For more information see:

http://deviceanalyzer.cl.cam.ac.uk/
What DeviceAnalyzer stores

- **User habits and usage:**
  - When you turn your phone on and off, system's local time, the times when you take pictures and how many pictures you have, the times when the screen is turned on and off or your device is unlocked, the brightness level of the screen and whether brightness is dynamically adjusted, periodic sensor readings, such as brightness, acceleration, air pressure, ... (depending on availability), whether the phone is roaming or not, the amount of data transferred over 3G and wifi, the times when phone calls are made and text messages are sent and received as well as the number of characters per text message, hashed values for the phone numbers involved, as well as whether the number is local or international, and if it comes from a contact, the number of contacts and per contact the number emails and phone numbers stored, power usage throughout the day, data transferred per application, location in terms of GPS coordinates

- **Digital environment:**
  - Cellular signal strength, RSSI, hashed data about wifi networks that are in range, which network connected to, link speed
More on Android SMS Collection

- Only applicable if you opt for full level participation

- Developed at the National University of Singapore, which allows one to automatically submit SMS messages on their Android device to Gmail as a draft email. You can opt for an automated or manual submission, which means you can choose which texts to share. The user will have the choice of sending us an email and it will be completely up to them if they decide to share the data with us.

- For more information see: http://wing.comp.nus.edu.sg:8080/SMSCorpus/appUserGuide.jsp

- Installation instructions will be slightly different if you decide to take part in the study.