

# *Electrotactile Feedback*

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## Project Outline

### Motivation

Electrotactile Feedback offers an interesting alternative to traditional haptic feedback and presents many benefits in certain settings. We do not currently know much about what parameters provide the best user experience when interacting with specific widgets (such as button presses, text input, radio buttons and multi-select), which has been the primary motivation for phase one of the project – to gather which parameters users find preferable. Phase two looks more into how we can take this knowledge, refine the parameters to actually provide a good user experience using electrotactile feedback.

### Aims

This project will consist of a minimum of two phases of user experimentation. A basic application developed for phase one should contain various widgets, and where interacting with these widgets should send a pulse to the electrotactile device. Dials are provided which allow users to tune the strength of the pulse by altering parameters. Participants should be shown a variety of these widgets and asked to tune the parameters of the sensation until they find the stimulus appropriate for the widget in which they are interacting. Once this data has been processed, we aim to be able to come up with some presets for the second phase of experimentation, which will ask a separate set of users to interact with the same widgets as before, but instead of tuning the parameters manually they select a preset which they find most appropriate.

### Progress

- Some background research on electrotactile feedback has been conducted.
- Very basic Django web app was created, however we decided to move away from this and use a native app instead.
- Simple native python application to display widgets and send pulse to electrotactile device has been developed.
- Ethics approval obtained to run (first phase) experiment.
- First phase experiment has been conducted with around 10-15 participants.
- Analysis of the data obtained from the first phase of experimentation is underway and should be completed prior to returning to the university in January.

## Problems and risks

### Problems

- Biggest problem has been recruitment of participants for phase one of experimentation. This is probably due to the timing of the experiment being close to the end of semester where many students have returned home or are not on campus.
- Minor issue with device resetting takes a few milliseconds, so for text widget, cant type too fast.
- How the parameters interact with each other is still somewhat unclear so noticing trends in data difficult.

### Risks

- Data quite subjective and spread out, going to be hard to analyze. Try to mitigate this by getting as much data as possible.
- Phase two recruitment – learning from the challenge of recruiting for phase one, this is a known challenge, so will start recruiting well in advance and will try to ask people what days they are available instead of me telling them when its happening.
- Direction – where to go next may not always be clear, to mitigate this, develop a clear plan with supervisor.

### Plan

- **Xmas**
  - Complete analysis of phase one results and conduct more experiments where possible to strengthen data.
- **Semester 2**
  - Week 1-2: Set up and perform phase two experiment.
  - Week 3: Perform analysis of these results.
  - Week 4-6: Develop some sort of application which utilizes electrotactile feedback. This application will likely be fairly superficial, but will utilize the results from the experiments.
  - Week 7: Hopefully run another user evaluation using this application and the electrotactile device, however this is time dependent.
  - Week 8-10: Write up – Dissertation