inScent: a Wearable Olfactory Display as an Amplification for Mobile Notifications

‘ *Dobbelstein, D., Herrdum, S., Rukzio, E.*

This paper talks about an olfactory devices to be coupled with a mobile phones for notifications. The device is modular, compact and has a robust scent release system. The user study performed by the authors considers the subjective investigation of the developed product.

The users of the product wanted the product to be more fashionable and compact. The notifications were preferred in private personal spaces over public ones, to increase the control over the device. The pollution (over-use, superimpose and allergies) created by the device was also noted by the users. On the other hand, the idea of using a novel channel was appreciated by the users. The individualization and the modular design made the device very personal which was liked by the users. The emotional trigger generated by the device can also be used to create an appropriate effect.

The author conclude by saying that the scent should not replace the conventional notification channels, but can rather be used to augment the other experiences of the other channels. This mode of communication needs to be explored further to create a robust and a suitable device suited for different applications.

Augmenting spatial awareness with Haptic Radar

‘ *Alvaro Cassinelli, Carson Reynolds, Masatoshi Ishikawa*

This is an interesting way of using haptic feedback as an augmented artificial sensory organ for sensing obstacles. The author wanted to focus on modularity and range to tactile translation. The authors use the intuition that tactile perception and spatial information are related in human cognitive systems.

I think the prototyping was really great with inexpensive hardware and different type of sensors. The authors wanted to focus more on the proof of concept rather than creating a product.

The experiments performed involved being able to detect an obstacle from behind while performing a control task. The results seem to suggest that the Haptic Radar works successfully used to cause untrained users to move in response to the haptic input. It should be noted that participants responded to stimuli intuitively. Another conclusions of the experiments is that visual stimuli overpowers the haptic feedback. The paper raises lots of interesting questions which can be a part of user studies and experiments later on.

Airwriting: Hands-free Mobile Text Input by Spotting and Continuous Recognition of 3d-Space Handwriting with Inertial Sensors

‘ *Christoph Amma, Marcus Georgi, Tanja Schultz*

The authors use gestures to perform handwriting recognition in a 3-D space. The handwriting recognition is performed in two parts, first the handwriting is spotted and then recognition is used to generate text. The data is acquired from inertial sensors attached to the user's hand.

The spotting phase is done using SVM to generate a two class classifier(handwriting or non-handwriting), the handwriting is then forwarded to the recognition phase. It uses a HMM based model to synthesize text. The models were used to generate letters, which were used to create words and further sentences. The dataset used had over 8000 words.

The authors perform experiments to measure different metrics associated with the recognition. The metric used was the minimal edit distance. The authors evaluate person dependent and person independent performance. This paper introduces a robust algorithm for spotting and further describes a system architecture for text generation which can be used in other gesture related problems.

Conductive rubber electrodes for earphone-based eye gesture input interface

‘ *Hiroyuki Manabe,Masaaki Fukumoto,Tohru Yagi*

This is a wearable eartip EOG sensors which can be interfaced to the earphones. The experiments were conducted with different 'Rubber', 'Disc', 'Mold' and 'Spring'.

The prototypes were tested for different parameters such as balance of electrode potential, stability of baseline, motion artifacts and compatibility. The next set of experiments were designed to test various applications and compare their results based on false negatives, false positives and recognition error. The different motions were also tested to see which could be selected to generate minimum artifacts.

The several prototypes were compared and their evaluation led to different conclusions about the applications and the materials used. The conductive rubber with Ag filler minimized motion artifacts while achieving suitable artifacts. This work is mainly focused on exploring the design space associated with this product and there is more room for research based on the results from the this study.

Design of a Wearable Tactile Display

‘ *Francine Gemperle, Nathan Ota, Dan Siewiorek*

This paper talks about a tactile display design which was created at Carnegie Mellon. The paper separates tactile display from hap-tics by stating that tactile displays take information cues directly from the visual and auditory stimuli in the user's environment.

The research starts with defining the requirements for the display as lightweight, silent, tiny, low power, discreet and can be felt through the clothing.

The paper discusses various hardware components such as tactors (and hardware changes required to make it better), wireless communications system, power supply(for the tactor and the wireless system) and the harness design (taking care of comfort,flexibility). The paper then discusses various possible applications of the system. It can be used for navigation purposes to provide subtle nudges. It can be used as an interaction device with a smart environment(as Aura). This can also be used for sending notifications.

This paper concludes with discussing the harness's design's improvements over 3 years. The authors know that this can not be hearing or vision as our primary sense, but it can definitely be used to augment those senses and add another dimension to the immersive environment around us.