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Speech Driven Environmental Control System (SPECS) – From Specification to Prototype

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Introduction

The SPECS project is designing a new speech driven environmental control to include use by people with dysathric speech. The project is funded by the National Institute for Health Research and is developing the device with a large UK assistive technology company. The aim is that the device will be designed in a user-centric way.

The initial stage of the project involved performing detailed qualitative interviews of people currently using speech-driven environmental control systems and a focus group of professionals which discussed current speech-driven environmental control systems and 'blue sky' ideas. Data from these were rigorously analysed using a framework approach [1]. This enabled full specification of the proposed new device and the results of this stage have recently been published [2].

This paper will present the process undertaken to go from specification to prototype testing, how user involvement has been incorporated and will discuss the key findings to date. At the time of RAATE 2009 we will be nearing completion of the prototype testing.

Overview

At RAATE 2007 we ran a workshop to feedback the findings of the initial stage of the SPECS project and to collect further professional feedback. Since this workshop the project has been advancing through it's second and third stages – taking the project from specification through to a prototype and prototype testing. As with the initial work the emphasis on user involvement has been maintained.

The development stage comprised of a number of parts, initially these looked at the interface for the device and utilising paper prototyping, 'Wizard of Oz' and RITE (Rapid Iterative Testing and Evaluation) methods. This enabled the interface specification to be further refined. Moving towards prototyping has involved collecting the speech data from the participants to be used to model their speech and set up a prototype device for them to test. For participants with dysarthria a further training phase has been conducted to enable collection of further speech data for refinement of the models and to be able to train their utterance to be similar to their model [3, 4, 5]. The final aspect of the prototyping stage will enable participants to use the full SPECS interface for between one and two hours and give feedback on this.

The third and final stage of the current SPECS project is an extended evaluation. Participants will have the SPECS device set up in their homes and then trial it for two months. During this trial period participants will be asked to complete a diary and follow up telephone calls and a mid-trial review visit will be performed. At the end of

the two months a qualitative interview will be carried out to collect final opinions. At the time of RAATE it is proposed that this stage will be nearing completion and so preliminary results of this and the preceding stages will be presented.

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