

# “How was School today...?” - A Prototype System that Uses Environmental Sensors and NLG to Support Personal Narrative for Children with Complex Communication Needs (Proposal for System Demonstration at SLPAT 2010)

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In this demonstration we will present a tool that supports children with little or no functional speech and additional motor, language, cognitive, and/or sensory perceptual impairments to create stories about their day at school (Figure 1). The tool uses Natural Language Generation (NLG) technology to create a draft story based on sensor data of the child’s activities. This draft can be edited by the child before she uses it to interactively narrate her experiences of the day. The system is still in its early stages, but we believe it has great potential to support interactive personal narrative which is not well supported by current Augmentative and Alternative Communication (AAC) tools.



*Figure 1: A child with complex communication needs using the prototype in a conversation about the school day with a researcher*

We will demonstrate the prototype system which was developed during a one year feasibility study in collaboration with staff and children at a special school. We will show how the system uses (both short and long range) Radio Frequency Identification (RFID) sensors to track the user’s location and her interaction with school staff and learning or teaching objects. We will discuss the data collection process and the issues that arise.

The demonstration will show how users can edit a generated draft story using a touch screen or switch accessible interface and how users interactively narrate

their story using a narration interface. We will also discuss the editing options that allow a user to personalise the generated story.

In addition, we will give detail on the NLG processes involved in generating narrations and filtering of events for reportability. NLG enables flexible narrative, including lexical variety, narrating the story in a preferred order, and pronouns based on discourse context. The filtering processes use additional data such as staff lists, timetables and dinner menus. Several heuristics such as whether events are exceptions to routine are used to determine whether events are interesting enough to be included in the draft. We also use recorded voice messages from staff since voice message recordings are an established tool in AAC to support interactive narrative. The demonstration will show how we incorporated recorded voice messages into the prototype and extended their usability.

All demonstration will be supported by video material from the evaluation of the prototype in a special school.

We will invite the audience to discuss our current work. One of our goals is to make the software more robust and less intrusive for both staff and children. For this purpose we have started experimenting with Wifi-based location tracking, and 2D bar codes to replace the RFID technology.

The new prototype will also be adaptable to children with different cognitive capabilities. Children with good cognitive capabilities will be given more control over story personalization and narration. We will demonstrate how this impacts on the system architecture, interface, and the NLG processes involved. Time allowing, we will also present mockups of our future system and will encourage discussion and feedback on our current work.

## References

Black R, J Reddington, E Reiter, N Tintarev and A Waller. (in Press). Using NLG and Sensors to Support Personal Narrative for Children with Complex Communication Needs. SLPAT. Los Angeles, 1-6 June 2010