

P. Marti, L. Giusti. *Crafting sensorial stimulation and social exchange in dementia care. Gerontechnology 2008; 7(2):161.* We present a research project, the Multi-Sensory Room (MSR) with technological solutions for dementia care. The general aim of the Multi-Sensory Room¹ project was to study how robotic and ambient technologies can be designed and used to create a therapeutic environment for patient affected by dementia that stimulates their cognitive, social and physical abilities, and promotes the emergence of intrinsic motivation, engagement and self-expression, without renouncing an accurate control of stimulation and fine tuning. MSR also offers the opportunity to discuss and explore fundamental design issues in care settings: (i) opening of the design space to include not only technological and clinical aspects but also psychological, emotional, social and cultural factors, aesthetics and ethical considerations; (ii) definition of requirements based on the actual needs, wishes and dreams of people that experience the condition of disability; (iii) promotion of the participation of different stakeholders: from patients to therapists, from nurses to physicians, from care-givers to managers. **The multi-sensory room** The MSR is a space augmented by ambient and robotic technologies that can be configured for different therapeutic activities on the basis of sensorial stimulation and social exchange. The space is a 4x4x3m booth painted in a neutral shade. Lighting is provided by modular components controlled by a PC unit; it can be static or dynamic with a selection of 16 millions of colours and fading effects. The lighting system can be used on its own or can be connected to two different kinds of robotics tools: the Rolling Pins and the Light&Sound Cylinders². Light&Sound Cylinders is a system composed of four cylindrical units that the patient can stack according to different configuration, permitting them to change colour and generate audible feedback. According to the selected application, different therapeutic tasks are supported, for example 'Mixing Colour' (mixing the colours of the stacked cylinders) or 'Colour Match' (identifying two units with the same colour and stack them; if the configuration is correct, both units will blink). A Rolling Pin (RP) consists of a semi-transparent plastic tube. The RPs are capable of measuring their orientation and the speed of their rotation to activate a visual (colour modification), tactile (vibration) or auditory feedback. The peculiarity of the RPs is that they are able to communicate with each other. The RPs are usually used in pairs, since the local feedback of each RP can be dynamically set depending not only on its own speed and orientation, but also on the speed and the orientation of the peer RP. The RPs were specifically designed to support social relationships between the therapist and the patient, providing them with the opportunity to establish a dialogue based on visual, aural, tactile and sensory-motor interaction modalities. Different assessments of the Multi-sensory Room have been performed to collect qualitative and quantitative data on the configurability and flexibility of the system, the acceptance of the system by therapists and patients and the behavioural answer of patients to ambient and local feedback. Preliminary results show that the MSR provides a context for relaxing, engaging and stimulating the patient without renouncing the stimulation control and fine tuning³. These are key values of any therapeutic intervention⁴. **Discussion** For the development of the MSR, user-centered and participatory design practices have been applied, including in-situ observation, activity analysis and concept design, prototype development and evaluation by means of an iterative process involving therapists and dementia affected subjects. The Benefits and challenges of such a design approach are discussed together with the efficacy of the solutions for the wellbeing of the elderly.

References

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