Profile of candidate:
Masters degree in Human-Computer Interaction or related field. Experience with user-oriented design methods, particularly prototyping and participatory design is required and a background in mediated remote communication or tele-presence is welcome. The student should enjoy working with closely with users, understand system architectures, have solid programming skills, including Java, Javascript, C or C++. Fluency in written and spoken English.

Summary:
Communication appliances are extremely simple networked devices that exchange diverse forms of data (images, video, sound, gestures) to enhance peripheral awareness of each other at a distance. This thesis will build upon the principles of co-adaptive instruments and substrates to create novel communication technology.

Objectives:
The goal of this thesis is to explore how concept of co-adaptation, in which users both adapt to interfaces and adapt them for new purposes, can help users create highly personal forms of communication with the people they are closest to. Users will be able to create private 'communication appliances' or 'comm apps' that serve as private communication channels that support diverse technologies, including both commercial devices and their own fabricated objects. Users should be able to define their own forms of communicative interaction and collaboratively modify it over time. This thesis will also explore to create communication appliances as 'temporal substrates', that can be accessed through instruments, under the user's control.

Context:
Although there has been an explosion of inexpensive new communication technologies, including smart watches, phones, and tablets, as well as a wide variety of interactive 3d printed objects, users have difficulty in managing this technology. Our challenge is to find the simplest possible ways to help people stay in touch with the people they care about most. The InSitu/ExSitu research team has been exploring mediated communication for over a decade. The EU interLiving project developed a suite of 'communication appliances' of varying bandwidth to explore multi-scale communication among remote family and friends, and the Digiscope project addresses remote communication across multi-surface interactive environments featuring interactive tables and wall-sized displays.

This thesis is associated with W. Mackay's ERC Advanced Grant (CREATIV), which seeks to create more effective human-computer partnerships through co-adaptive instruments.

Method:
The thesis will begin by reviewing the existing literature on communication appliances and family communication. The student will then engage in a series of participatory design
activities with users, to determine specific needs. The student will also develop an architecture for creating simple, collaboration technologies that can be created and adapted by users, which builds upon and extends the notion of substrates into a ‘temporal substrate’. The thesis will involve the design, implementation and testing of prototypes that support inter-family communication.

Expected Results:
This thesis will enhance our theoretical understanding of the principles of substrates and co-adaptive instruments, with a specific emphasis on temporal substrates; it will provide novel communication technology that enables family members to stay in touch in a coherent way, despite using a wide variety of interactive devices, and will provide empirical results as to how these technologies support mediated communication over time.

References: