TaskCam

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Figure 1: 3D-printed and paper-clad TaskCams. © 2018 Interaction Research Studio

open-source distribution of TaskCams as a novel approach to disseminating a research methodology.

In this demonstration we show a number of completed 3D-printed and Paper TaskCams, and demonstrate how to assemble them using the resources available from the project website.

Author Keywords
Design research; cultural probes; user studies; context studies; open source; making.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

Introduction
TaskCams (see Figure 1) are simple digital cameras designed for user studies. In addition to the camera and a trigger mechanism, they include a small screen on the

Abstract
TaskCams are simple digital cameras designed for studies of users and their contexts. Researchers and practitioners can build their own TaskCams using instructions and videos from www.probetools.net, off-the-shelf parts, and a custom Arduino shield made available from the site. There is a myriad of options for customisation and modification, allowing researchers to adopt and adapt them to their needs. We view the

A Camera for Cultural Probes Studies

TaskCams are designed for design-led studies of people and their settings.

Cultural Probes are collections of evocative tasks designed to elicit evocative responses that can provide insight about participants [2,4,5].

Usually designed to be simple, playful and open-ended, Probes make a virtue of ambiguity [5], encouraging evolving dialogues with participants rather than authoritative accounts.

TaskCams recreate one of the most frequently reiterated probe tasks, disposable cameras relabelled with requests for pictures, in a device that can be reconfigured and reused multiple times.

Thus TaskCams encourage the adoption of the Probe's playful ethos, while remaining open for more traditional uses.

back that shows short texts asking questions or requesting images, which can be scrolled using buttons mounted on either side. When a photo is taken, it is stored on an internal flash card and tagged with the text that is currently appearing. Each time a new photo is taken, a small tick (√) is added to a row above the text used to tag it. Flash cards can be removed to retrieve images, to change the list of texts, or to modify the operating code for the device.

TaskCams are designed as self-documentation tools for participants of user studies. In particular, they are intended to support Cultural Probes studies (see sidebar), taking advantage both of the ambiguity of images and the potential playfulness of requests. Available via open-source distribution, they are easy for researchers to customise in a variety of ways for the purposes of their own studies.

Making TaskCams

TaskCams are built on a custom PCB available from www.protools.net. A fully functioning TaskCam can be assembled simply by plugging an Arduino microprocessor [REF] into the PCB and inserting 2 AA batteries and a micro SD card, loaded with software available from the website, into the appropriate holders (see Figure 2). Currently the TaskCam hardware (including the Arduino Uno) costs about £35, or $45.

The resulting camera can be packaged for immediate use. Alternatively, the PCB, which is perforated and predrilled, can be snapped apart and reconfigured in a variety of ways. About a dozen configurations (including one for a screenless camera about the size of a box of matches) are possible without soldering simply by

plugging the separated boards together in different combinations, and other possibilities can be realised with a limited amount of soldering. This allows TaskCams to be constructed in a variety of forms chosen for their affordances or aesthetic qualities.

Technically, the PCB integrates a LinkSprite JPEG camera [7] and a battery pack with a 'shield' designed for the Arduino microprocessing platform [1]. The shield incorporates the text display, a Micro SD card reader, and the camera trigger, and in conjunction with the Arduino triggers the camera and displays questions and texts stored on the SD card. The SD card also holds the camera software, which can be downloaded directly from the website or modified to provide new functionality. See [3] for more details.

TaskCam Housings

TaskCams can be housed in a variety of casings, both to protect them and suggest cultural connotations to participants. We are releasing two 'official' designs for casings via www.probetools.net, one designed to be 3D printed, and the other made from paper or card (see Figure 1). In addition, we are making available many other, less resolved casing designs for makers to develop or modify.

The first 'official' case is designed to be produced on 3D printers (Figure 1). One of its most significant features is that it can be printed with no support material, allowing it to be made on a very wide range of printers including old or very inexpensive ones. The case is rectilinear and includes relatively large planes to which stickers can be attached, whether to add instructions or to 'brand' the devices for particular projects.

The second casing is made from paper or card cut from two A4 sheets. The design is distributed in the form of downloadable templates which can be printed directly on paper for hand- or laser-cutting. Using printed card or paper for this case makes customisation easy, whether through choice of stock or via printing, painting, or writing. The result is not as robust as the 3D TaskCam but is approachable and easy to customise.

Plans for the 3D casings are made available to download in all popular 3D formats (currently .STL and .STP) via a link on the website which leads to the GitHub repository [6]. Fully editable AutoDesk Fusion 360 designs are also available via the website. Because we are releasing the original 3D models for our designs, makers will have complete control to adapt or customise them at will.

Conclusion

We have designed TaskCams to be inexpensive, easy to make and use, and customizable tools for user research.

We hope that members of the CHI community will find them useful to adopt and adapt for their own studies.

Acknowledgements

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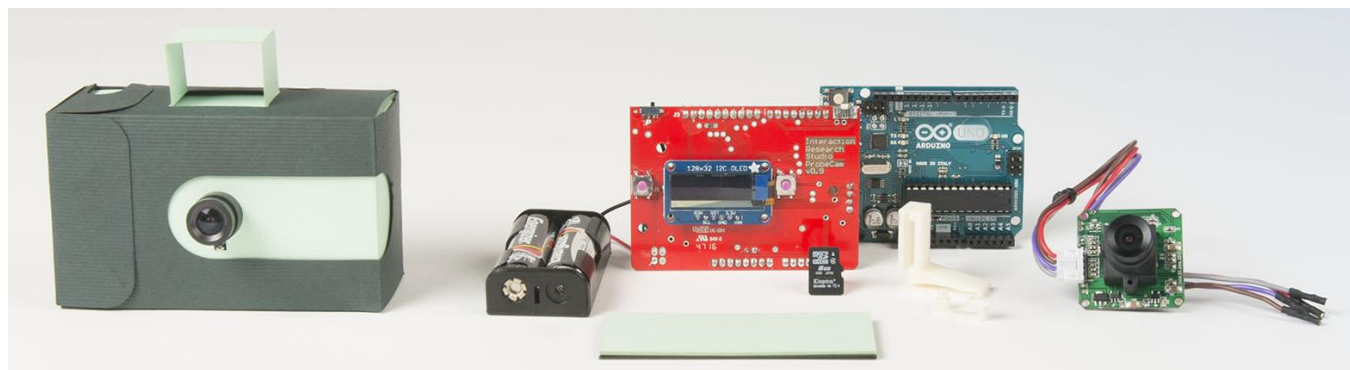
Figure 2. Paper TaskCam with hardware components. From left to right: battery holder, custom shield with SD card in front, Arduino Uno, and Linksprite JPEG Camera. © 2018 Interaction Research Studio

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