

Since 2000, the Equator Interdisciplinary Research Consortium has been involved in the design, construction, installation, testing and evaluation of a number of complex experiences involving pervasive and ubiquitous computing technologies. These experiences have been deployed into a variety of challenging spaces, including care homes, woodland [3] and the domestic environment [1], and this focus on real installations has enabled us to gather a significant amount of insight into the issues involved in this process.

We have found that putting together such installations can be a difficult. At a hardware level, significant amounts of effort have to be spent in developing reliable software proxies for physical devices, and this is made more difficult by common requirement of certain devices on particular types and versions of operating systems. Designing distributed architectures that allow these software proxies to be coordinated into an installation that exhibits a complex set of behaviours is also difficult, and the design and deployment of a particular installation often requires a close co-operation between a diversely-skilled set of individuals, who often may not have a detailed understanding of the details of each others fields of work.

The Equator Component Toolkit (ECT) [2] is a product of the knowledge that has been gained by the Equator project during the construction of these experiences, and adopts a design that has been informed by our efforts to simplify these difficulties. It presents an implementation of a distributed, component-oriented architecture which is available under the open-source BSD license from our project website [4]. ECT allow each software proxy to a particular device to be represented as a *component*, which is an item of re-usable software with well-defined interface, and is distributed with roughly eighty components, which have mostly been constructed by members of the Equator project. Some of these components are intended to act as software proxies for commonly-used ubicomp devices, and others present software-only functionality, such as the ability to connect to an IMAP-enabled email account, that we have found to be useful in putting ubicomp installations together. The ECT architecture allows components which are to be used in a particular installation to be distributed across multiple computers, and the provides functionality to support component discovery, component instantiation, the manipulation of component interfaces, the specification of a complex set of behaviours involving component instances, and the eventual destruction of a component instances when it is no longer required. ECT itself has been used by members of Equator to construct a number of installations, and has proven to be useful in this process (eg see [5] and [6]).

This tutorial is intended as an introduction to ECT, from the perspective of a potential user of the existing features of this software, rather than from the perspective of a developer who wishes to add new features. It is likely to cover the following topics, although this list is intended to be flexible, and can be changed depending upon the skills and knowledge of the participants of the tutorial:

1. introduction to the project website – introductory information, download information, installation information and component documentation
2. how to install and launch ECT on a single computer
3. overview of ECT functionality – explaining the details of its most frequently-used graphical interfaces
4. constructing a simple installation using software-only components

5. constructing a simple installation using components controlling the Phidgets family of devices (we will provide these, though some people may have to share devices)
6. overview of other devices that can be controlled by ECT (including demos, if participants wish)
7. (if there is sufficient time) constructing an installation spanning multiple computers
8. any other requests from participants

In addition, Equator project members will be able to give further details about ECT development issues after the tutorial has finished.

The principal contact for further details of this tutorial is:

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References

- [1] Gaver, W., Bowers, J., Boucher, A., Gellerson, H., Pennington, S., Schmidt, S., Steed, A., Villars, N. and Walker, B. *The drift table: designing for ludic engagement*, CHI 2004 extended abstracts on human factors in computing systems, Vienna, Austria
- [2] Greenhalgh, C., Izadi, S., Mathrick, J., Humble, J. and Taylor, I. *ECT: A Toolkit to Support Rapid Construction of Ubicomp Environments*, Proceedings of UbiSys 2004 at UbiComp 2004, Tokyo, Japan
- [3] Rogers, Y., Price, S., Fitzpatrick, G., Fleck, R., Harris, E., Smith, H., Randell, C., Muller, H., O'Malley, C., Stanton, D., Thompson, M., and Weal, M. (2004). *Ambient wood: designing new forms of digital augmentation for learning outdoors*. In Proceedings of 2004 conference on Interaction design and children: building a community (IDC 2004), Maryland, USA, June 1-3, 3-10.
- [4] ECT project web-site : <http://www.equator.ac.uk/technology/ect>
- [5] Interactive skipping installation:
<http://www.cogs.susx.ac.uk/interact/projects/devices/skipping.htm>
- [6] Interventions with networked devices:
<http://www.interaction.rca.ac.uk/equator/ECT.html>