Pattern Languages for Interaction Design: Building Momentum

A CHI 2000 Workshop

Latest News

- The Call for Participation is available online now on the CHI 2000 web site! See "How To Participate" below for more information. Note that the submission **deadline** is on **January 28, 2000**!

Organizers

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Topic: Pattern Languages For Interaction Design

Theme

The potential of pattern languages as a vehicle for the dissemination of human-computer interaction design knowledge has been recognized within the CHI community for a number of years, e.g. [4]. This potential is based on the ideas of the architect Christopher Alexander, for recording the designs of 'living buildings' [1-2]. Patterns are developed to record the **invariant** property that must exist in a design detail which resolves the conflicting social, cognitive, and technological forces which are ubiquitiously present in constructions of that type. Patterns are interlinked into a network (a **pattern language**) so that details that are required to complete a design may be identified, and the larger issues surrounding a particular design decision may be recognized.

These ideas have been taken up by the object-oriented computing community [5-6], developments there being recorded in the series of **Pattern Language of Programming (PLoP) conferences**. In that community, it is the usefulness of patterns as a way of recording reusable design that has dominated. However, as Alexander pointed out in an invited address to OOPSLA '96, **there are other, deeper aspects to patterns**. As he envisaged pattern language, it records an aesthetic of design which makes for liveness, that 'quality without a name' which supports human well-being. Alexander has challenged the computing community to explore this aspect, and clearly, there is most scope for this exploration within the CHI community.

Goals

- To promote the **development** of pattern languages for interaction design.
- To refine and develop the **application** of pattern languages in this area.
- To develop an understanding of the **relationship** between interaction design and **software engineering** patterns.
- To extend the **community** of pattern writers.

Detailed description of topic

A **first workshop** on pattern languages in human-computer interaction (HCI) took place at **CHI'97**. It spread the idea of interaction design patterns to the CHI community, but one of its central findings was that there was still a vast variety of views as to what interaction design patterns could be.

The next major meeting on interaction design patterns took place at **ChiliPLoP'99**. Jan Borchers, one of the proposers for the present workshop, attended, and found that he was the only "CHI" person around! It turned out that there were very different views of interaction design patterns in the software engineering community present at that workshop. It became clear that interaction design patterns would be a good means to simplify **communication between software engineering and HCI**. The workshop also produced an initial attempt of a **definition and classification** of interaction design patterns [3].

These initial attempts were refined and extended substantially at the INTERACT '99 workshop, which Richard Griffiths, Lyn Pemberton, and Jan Borchers co-organized, and in which two members of the CHI'97 workshop, John Thomas and Sally Fincher, participated. Particular issues were recognized at this workshop:

- That interaction design patterns have **social, cognitive, and technological** aspects.
- That different levels of interaction design patterns need to be inter-networked.
- That a classification scheme and method are required. An initial **classification scheme** was proposed.

The workshop created, among other results, an example format for user interface patterns, and was rated very successful by the participants. Many of them plan to come to the upcoming CHI2K workshop.

The workshop at CHI2K will build on these previous efforts, and push the field of interaction design patterns further. In particular, placing emphasis on Alexander's deeper aspects of patterns and attempting to incorporate his latest work could help to resolve issues such as the following:

- Formal versus informal **presentation** of interaction design patterns. Alexander's original intention was very much directed at user-participation and the format of his patterns was designed to allow that. Is it more appropriate to use informal patterns for user-participation and more formal patterns for human factors to developer cooperation, and, further, perhaps advanced pattern languages for dealing with technically complex interactive systems?
- How best to **find** interaction design patterns. The appropriateness of '**antipatterns**'. Where to look for interaction design invariants.
- **Levels** of interaction design patterns. Some interaction design patterns relate to interface widgets, others to social and cognitive aspects of interaction design. Comprehension of these levels will assist

with the development of interaction design patterns and their relationship with software engineering patterns.

- Patterns and pattern **languages**. Alexander implies that "when the patterns [are] connected to one another in a network, ... they form a language", and that a pattern language contains patterns and patterns about patterns. This opens the question of how to reconcile patterns from different sources so that they become part of a language.

- How to **structure** an interaction design pattern language. This is important to support the maintenance and retrieval of patterns, but what organizing principles should be applied?

Why User Interface Patterns?

The succession of workshops at major international conferences clearly shows that this is a topic in which interest is developing. On the face of it, **building design** would appear conceptually to have much in common with interaction design, both being concerned directly with human use of designed artefacts.

It is surprising, therefore, that it has been object-oriented software designers, supporting the design of software architectures, and not interaction designers who have been first to take up the pattern language concept. Interaction design patterns will improve communication with these software designers. However, **interaction design can benefit more directly** from its common concern with architecture, to perhaps catch up with this surprisingly rapid development of software architecture patterns.

Christopher Alexander has continued developing his ideas on design, and his new book on **"The Nature of Order"** may become available before the workshop. If it does, it will probably represent a major event in the development of design theory, and an examination of its implications for interaction design may be a way of creating stronger conceptual links with other design disciplines.

Format of the Workshop

The workshop is designed as a **two-day mix of practical activity and theoretical discussion**.

A Very Tentative Schedule for the Workshop

Day 1: Mainly Practical

Time	Activity	Notes
09:00-09:30	Introductions and scene setting	
09:30-10:30	The current **state** of interaction design patterns	
10:30-10:45	-- Break --	
10:45-11:00	The **"writers' workshop"** format	The procedure to be followed will be described
11:00-12:00	Pattern writers' workshop 1	In groups of 5, one writer's pattern examined each
12:00-		

01:00		
01:00-02:00	Pattern writers' workshop 2	
02:30-02:45	-- Break --	
02:45-03:15	Review of the writers' workshop process	
03:15-04:00	Alexander's **"The Nature of Order"** briefing	Subject to availability

Day 2: Mainly Theoretical

Time	Activity	Notes
09:00-10:30	**Applying** patterns	Breakout group exercise
10:30-10:45	-- Break --	
10:45-12:30	The **characteristics** of interaction design patterns	
12:30-01:30	-- Lunch --	
01:30-02:30	**Structuring** pattern languages	
02:30-02:45	-- Break --	
02:45-04:00	Identification of **best practice** and issues for **further research**	
04:00-06:00	Preparation of poster	

Breakdown of Subtopics

Introduction and Scene Setting.
The participants will briefly introduce themselves, and the structure of the workshop will be elucidated.

The current state of interaction design patterns.
A plenary discussion in which the current state of play will be determined. The discussion will be initiated by the presentation of a summary of points raised in attendees' position statements.

The "writers' workshop" format.
The format of the pattern writers review procedure, as used at PLoP workshops, will be outlined.

Pattern writers' workshops.
In small breakout groups, one pattern in each hour session will be reviewed, using the format previously presented.

Review of the writers' workshop process.
A plenary feedback on the review process.

Alexander's "The Nature of Order" briefing.
A brief resume of the ideas (the 15 fundamental properties) will be given. This is intended to stimulate issues to be introduced into subsequent discussion. We will address this topic in more detail if the final version of the book becomes available before the workshop.

Applying patterns.

In small breakout groups, participants will discuss the application of submitted patterns in design practice.

The characteristics of interaction design patterns.

This discussion will focus on attempting to characterize the specific qualities of interaction design patterns. Issues that will be addressed: formal vs. informal **presentation** of interaction design patterns; how best to **find** interaction design p atterns; and **levels** of interaction design patterns.

Structuring pattern languages.

A number of approaches to structuring pattern languages are possible. This discussion is intended to take the previous topic further into practical application. Issues that will be addressed: relationship between patterns and pattern languages; and how to structure an interaction design pattern language.

Identification of best practice and issues for further research.

Preparation of poster.

Experience at our INTERACT'99 workshop indicates that this activity can be extremely stimulating and productive. However, participation in this open ended activity is at the discretion of participants.

How To Participate

Please have a look at the Call for Participation on the CHI 2000 web site. Submit a brief **position paper** (about 2-4 pages) and at least one potential **interaction design pattern** to Richard Griffiths. The pattern does not have to be entirely original, but it has to be an example of what you think an interaction design pattern should look like. The position paper should be in the CHI proceedings layout. For your pattern, you can use the format proposed by the INTERACT workshop. **Electronic submissions** via email as Word 97, RTF, or PDF attachments are welcome (other formats upon request.)

We will select participants on the basis of their interest and familiarity with the topic. You should have read some of Alexander's pattern books [1-2].

Note that the submission deadline is on January 28, 2000!

Facilitation of Workshop Activities

It is envisaged that many of the participants will be familiar with each others' positions from the position papers as well as participation in previous workshops and contribution to discussion lists (for example, pattern-language-hci@mailbase.ac.uk, which came out of the INTERACT'99 workshop). This should assist in creating a productive atmosphere at the workshop.

All of the workshop organizers have been participants in previous runs of the activities proposed, and will be responsible for facilitating the breakout groups formed and ensuring discussion during the workshop. They have all organised and run workshops at major conferences.

Pre-workshop Activities

Participants will be encouraged to begin the discussion through a **mailing list** set up to support the workshop. In addition, this **web site** will contain materials, and pointers to material relevant to the workshop. The position papers and example patterns submitted by participants will be made available here.

Dissemination of Results

Results of the workshop will be presented as a poster during the CHI2K poster session, as well as a full workshop report for the SIGCHI Bulletin.

Organizers' Backgrounds

Richard Griffiths is a senior lecturer at the University of Brighton, School of Computing and Mathematical Sciences, where he teaches undergraduate and masters level courses in human-computer interaction design. He has industrial experience in both information systems and system software design and implementation, has supervised Teaching Company (technology transfer) schemes in the multimedia industry, and undertakes consultancy in HCI design. He is currently supervising a Teaching Company scheme involving documenting the design of interactive television programs using a pattern language approach.

Lyn Pemberton is a senior lecturer at the University of Brighton, School of Information Management, where she teaches courses in User Centered System Design, Multimedia Applications Development, CSCW and Technical Authoring, and has a special interest in multilingual and multicultural interface design. She has carried out requirements analysis, interaction design and evaluation on a range of projects funded by British Telecom, the DTI, the European Commission and the US Office of Naval Research.

Jan Borchers is a researcher at the Telecooperation Group, University of Linz, Austria, and working as visiting scientist and lecturer at the University of Ulm, Germany, teaching courses in Designing Interactive Systems, Web Design, and Telecooperation. He has carried out project management and user interface design on a number of projects dealing with interactive exhibits, including an award-winning music exhibit, and has a special interest in bringing HCI, software engineering, and user domain concepts together in interdisciplinary, formalized pattern languages.

Richard Griffiths, Lyn Pemberton and Jan Borchers recently organized a two day workshop, "Usability Pattern Language: Creating a Community" at INTERACT'99, Edinburgh, 30th. August-3rd. September 1999.

Adam Stork is a Research Fellow at the Ergonomics & HCI Unit at University College London. He has been involved with computers for around 20 years and has been directly involved in the development of over 50 human-computer systems. He has managed and been involved in research projects concerning Method Assessment, Emergency Management Computer Aided Training, and Electronic Information Provision, and has just completed a PhD in HCI. His primary research interest is the acquisition of explicit knowledge that is validated to design more effective human-computer systems. He considers design patterns to be an important step in the development of HCI.

References

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3. Borchers, J. O. *CHI Meets PLoP: An Interaction Patterns Workshop*. ACM SIGCHI Bulletin, January 2000.
4. Casaday, G. *Notes on a Pattern Language for Interactive Usability*. Proceedings of CHI'97.

5. Coplien, J. O., and Schmidt, D. C. (eds.) *Pattern Languages of Program Design*. Reading, Mass: Addison-Wesley, 1995.

6. Gamma, E., Helm, R., Johnson, R., and Vlissides, J. *Design Patterns: Elements of Reusable Object-Oriented Software*. Reading, Mass.: Addison-Wesley, 1995.

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