From Research Hypotheses to Practical Guidelines: A Proposal to Facilitate Researcher—Practitioner Interaction

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Abstract
In this paper, we describe the gulf that exists between research findings and their adoption in practice. We propose ideas that have the potential to increase the collaboration between researchers and practitioners to forge a symbiotic relationship between these two worlds. Our proposal includes highlighting industry constraints in academic HCI classes, encouraging researchers to present practical implications in papers, creating a collaborative platform between researchers and practitioners, and fostering strong relationships between HCI students and industry professionals.

Keywords
Research, practice, collaboration

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Every year, more than a dozen high-quality research conferences take place across the world in the area of human-computer interaction (HCI). At these conferences, researchers from top universities and research labs present thousands of findings from cutting-edge research projects. Many of these findings are later consolidated and archived as journal publications. Even though this accumulated knowledge on various topics, issues, challenges, and frontiers of HCI is immensely valuable, it often takes years or even decades for it to permeate into practitioners' vernacular and adoption. In this position paper, we propose preliminary ideas to reduce the gulf between researchers and practitioners to limit the divergence between cutting-edge research ideas and the state of the art in product design and implementation.

Problem Statement

The goals of academia/research projects are often science-oriented with an emphasis on methodological rigor, investigation of cause and effect, focus on measurement, etc. Researchers tend to study problems in the abstract, even going to the extent of isolating or controlling most parameters in the problem space. This results in an analysis that is often detached from more practical contexts.

The goals in industry are often engineering-oriented with an emphasis on optimizing the production throughput for a given set of resources. Methodologies and processes are abridged, sometimes barely reflecting their original intentions, with a relentless drive to ship products in accordance with business deadlines. This results in practices that focus more on speed than on creating a product of the best quality.

The challenge here is to align the goals of researchers and practitioners in such a way that there is greater transference of knowledge and expertise between these two roles in a symbiotic relationship.

Towards a Symbiotic Relationship

Given the nature of research goals and processes, academic publications are generally long and abstract. They often include details of methodologies employed, experimental design, and a nuanced analysis of observed effects. Justifiably, practical implications are not the core focus of these manuscripts. In contrast, practitioners are more concerned with implications of study results, guidelines to structure interaction design and evaluation activities, and potential challenges or pitfalls in the practice of the discipline. Their interests are predominantly applied rather than scientific discourses. They seldom have the time or resources to read scientific manuscripts with the idea of gleaning information relevant to them.

However, practitioners ultimately demonstrate the effectiveness and utility of different findings by putting them to test in real-world situations. Many times, their instantiation and adaptation of research concepts improve upon and add to what was originally proposed and developed in research labs.

There is great value in reducing the time it takes for research ideas to go from a lab to the field. Each role can contribute to solving the problem by bringing their respective abilities.

What Practitioners Need

Because of the often ad hoc business constraints, practitioners operate within process iterations that have

fast turnaround times. This results in a need for accessing research findings quickly and easily. For example, in deciding between two design ideas: is it better to put data items in a column or a row where a user task involves comparing among those data items? What is more effective: using symbolic patterns to differentiate different parameters on a graph or color?

At a slightly higher level, what are the advantages and disadvantages of a particular contextual inquiry technique? In what situations is it more applicable? How can one codify, capture, and propagate interaction context in a traditional desktop application?

Because practitioners operate in heavily constrained space due to development platforms, legacy patterns and practices, and other "standards" with respect to branding and user experience styles, they do not have much freedom to advocate and adopt cutting-edge interaction paradigms. Having readily available case studies demonstrating the effectiveness of such paradigms will help practitioners make an argument for their adoption.

Disconnect Between What Is Taught In HCI Classes And Industry Requirements

A fundamental problem with HCI education is the missing connection between what is taught in the classroom and the overall software development lifecycle that situates interaction design activities [1]. The software engineering and usability engineering classes are treated in isolation. Most textbooks in either of these two disciplines barely mention the connections and constraints between the SE and UE lifecycles [2]. Students graduating from such classes have no appreciation for the need to communicate, collaborate, and negotiate with counterpart roles.

Another related issue lies in the lack of discussion about real-world constraints and how they influence a development effort. Students learn about software development and interaction design in unrealistic classroom settings. For example many HCI student projects start at a concept stage and proceed all the way to prototyping and evaluation stages. In the real world, projects that neatly follow these stages are rare. A majority of work-in-practice deals with versions of ongoing projects which are already scoped and on which prior design decisions have already been made.

In a study we conducted to investigate the impact of communication and pedagogical factors in teaching HCI and SE classes, we identified many factors that affect the quality of interactive software development process and product. For example, we found that having real clients and appointed project leaders in HCI projects improves the learning experience of the students.

A Corpus of Practical HCI Findings

We believe that the gulf between research and practice can be bridged through a restructuring of conference proceedings. If major HCI conferences were to encourage authors to highlight practical implications and guidelines and present them in distinct sections of their papers, it will be possible to provide practitioners an archived digest of these findings.

In addition to making practical implications of research more explicit in conference papers, we envision a Wikipedia-style repository where latest research techniques and results are posted as opportunities for

adoption. These ideas can then be tested and refined through real-world adoption by practitioners and results posted back into the repository. This approach leverages the power of social networking as a vehicle for collaboration between researchers and practitioners, which will mutually benefit both parties.

Conduits Between Industry And Research Labs

Another proposal is to encourage senior industry practitioners, with formal training in HCI, to guide students through their Ph.D. dissertations by serving as members on thesis committees. This would provide graduate students with an applied perspective and would encourage them to think of practical applications of their research. On the other hand, practitioners would stay continuously engaged with current trends in research by actively engaging with the student.

These industry connections via practitioner committee members can potentially lead to internships where the students can put their research to work. Through internships, students learn about industry constraints while their project team members will learn about cutting-edge research directly from the researcher.

Changing Research Culture To Embrace Industry-Based Evaluations

While controlled experiments are the cornerstone of scientific rigor in evaluation, real world case studies are valuable in their own right [3]. Even though case studies afford little to no control to the evaluators or observers, they provide broader confidence in effectiveness of higher-level research ideas. In this type of evaluation, one often observes a phenomenon and attempts to identify potential relations between the various aspects that were at play in the study and any perceived outcomes thereof.

Educating the research community and conference organizers on the importance of these studies can go a long way in bridging the gulf between research and practice.

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