The Editor's Spotlight: TOCHI Issue 23:1

In a new feature, as the Editor-in-Chief, I will offer up some thoughts on select articles as they appear in the pages of TOCHI (or to be more precise, as they grace the ACM's digital library, given our desire to turn around accepted manuscripts to the research community as quickly as possible—not to mention the electronic-first nature of publishing these days). And in addition, I will always strive to give an overview of all the content in each issue, to the extent possible.

But before I unshutter the brilliant beacon for the first time, with Issue 23:1 as its deserving focus, let me briefly set the context.

The purpose of these spotlight editorials is to help frame the contributions of the research that we publish in the wider context of the field as well as to direct attention to articles that may be of especial interest.

That, of course, serves not only our readers but also our authors—all of them—because by implication, bringing attention to our great content raises the profile of the entire journal.

By highlighting certain articles, my intent is not to suggest that others are not worthy of your attention. Far from it. Every article we publish has received exquisite attention from our editorial board, so the TOCHI brand in and of itself tells you that the content is always absolutely sterling.

Hence, these are not critical reviews or critiques. These articles have already passed the gauntlet of rigorous peer review, and so my purpose here is to help guide our readers as to the nature and importance of the contributions we publish.

As such, my hope is that both newcomers to the field of human-computer interaction (who may be missing some of the implicit framing and motivation that underlies many papers) as well as seasoned practitioners and students of HCI (who may be quickly scanning the journal's contents to see what catches their eye) can benefit from these remarks and reflections.

As well, astute authors-to-be can perhaps gain a few insights as to what level of contribution is necessary to pass muster at the journal—not to mention the ways of conveying one's results that tend to best resonate with TOCHI's reviewers and our Editorial Board.

To fully absorb and appreciate both the strengths and limitations of each article's scientific contributions, one must read them in detail, of course, as I hope you will be moved to do when one of these catches your eye—and as they originally did my own.

Just follow the "DOI" link immediately after each article to view it directly in the ACM Digital Library.

You can be the first to see these commentaries on the TOCHI News page (http://tochi.acm.org/news), which I urge you to follow. Please do help spread the word for those TOCHI articles that pique your interest.

And of course, all of your individual downloads, subscriptions, and citations are the loose change in the treasury of the journal's impact.

But they compound over time and slowly accumulate great intellectual riches.

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For the first article to highlight here, I selected a piece of work that strongly reminded me of the context of some of my own graduate research, which took place embedded in a

DOI: http://dx.doi.org/10.1145/2882899

neurosurgery department. In my case, our research team (consisting of both physicians and computer scientists) sought to improve the care of patients who were often referred to the university hospital with debilitating neurological conditions and extremely grave diagnoses.

When really strong human-computer interaction research collides with real-world problems like this, in my experience compelling clinical impact and rigorous research results are always hard-won, but in the end, they are well worth the above-and-beyond efforts required to make such interdisciplinary collaborations fly.

And the following TOCHI Editor's Spotlight article, in my opinion, is an outstanding example of such a contribution.

IN THE SPOTLIGHT: NAVIGATING GIGAPIXEL IMAGES IN DIGITAL PATHOLOGY

The diagnosis of cancer is serious business, yet in routine clinical practice, pathologists still work on microscopes, with physical slides, because digital pathology runs up against many barriers—not the least of which are the navigational challenges raised by panning and zooming through huge (and I mean *huge*) image datasets on the order of multiple gigapixels. And that's just for a single slide.

Few illustrations grace the article, but those that do—

They stop the reader cold.

The ruddy and well-formed cells of healthy tissue from a GI biopsy slowly give way to an ill-defined frontier of pathology, an ever-expanding redoubt for the malignant tissue lurking deep within. One cannot help but be struck by the subtext that these images represent the lives of patients that face a dire health crisis.

Only by finding, comparing, and contrasting this tissue to other cross-sections and slides—scanned at 400x magnification and a startling 100,000 dots per inch—can the pathologist arrive at a correct and accurate diagnosis as to the type and extent of the malignancy.

This article stands out because it puts into practice—and challenges—accepted design principles for the navigation of such gigapixel images, against the backdrop of real work by medical experts.

These are not laboratory studies that strive for some artificial measure of "ecological validity"—no, here the analyses take place in the context of the real work of pathologists (using archival cases) and yet the experimental evaluations are still rigorous and insightful. There is absolutely no question of validity, and the stakes are clearly very high.

While the article focuses on digital pathology, the insights and perspectives it raises (not to mention the interesting image navigation and comparison tasks motivated by clinical needs) should inform, direct, and inspire many other efforts to improve interfaces for navigation through large visualizations and scientific datasets.

Roy Ruddle, Thomas Rhys, Rebecca Randell, Phil Quirke, and Darren Treanor. 2016. The Design and Evaluation of Interfaces for Navigating Gigapixel Images in Digital Pathology. ACM Trans. Comput.-Hum. Interact. *23, 1 (February 2015), Article 5, 29 pages.*

DOI = http://dx.doi.org/10.1145/2834117

OVERVIEW OF VOLUME 23, ISSUE NUMBER 1: BRAIN-COMPUTER INTERACTION, AUDITORY DISPLAY IN MOBILE AUGMENTED REALITY, AND MASS INTERACTION IN SOCIAL TELEVISION

There's lots more to please the eye, ear, and mind in this issue as well.

And I mean that not only figuratively—in terms of nourishing the intellect—but quite literally—in terms of those precious few cubic centimeters of private terrain residing inside our own skulls.

Because brain-computer interaction (BCI) forms a major theme of Issue 23:1. The possibility of sensing aspects of human perception, cognition, and physiological states has long fascinated me—indeed, the very term "brain-computer interaction" resonates with the strongest memes that science fiction visionaries can dish up—yet this topic confronts us with a burgeoning *scientific* literature.

The first of these articles presents an empirical study of phasic brain wave changes as a direct indicator of programmer expertise. It makes a strong case that EEG-based measures of cognitive load, as it relates to expertise, can be observed directly (rather than through subjective assessments) and accurately measured when specifically applied to program comprehension tasks. By deepening our ability to understand and to quantify expertise, the article makes significant inroads on this challenging problem.
(http://dx.doi.org/10.1145/2829945).

The second BCI article explores ways to increase user motivation through tangible manipulation of objects and implicit physiological interaction, in the context of sound generation and control. The work takes an original tack on the topic by combining *explicit* gestural interaction, via the tangible aspects, with *implicit* sensing of biosignals, thus forging an intriguing hybrid of multiple modalities. In my view, such combinations may very well be a hallmark of future, more enlightened approaches to interaction design—as opposed to slapping a touchscreen with "natural" gestures on any sorry old device we decide to churn out, and calling it a day.
(http://dx.doi.org/10.1145/2838732).

Another intriguing effort delves into augmented reality of a somewhat unusual sort, namely augmentation of mobile and situated interaction via spatialized auditory cues. A carefully structured study, designed around enhancing interactive experiences for exhibits in an art gallery, teases apart some of the issues that confront realities augmented in this manner, and thereby offers a much deeper understanding of both the strengths *and weaknesses* of various ways of presenting spatialized auditory feedback. As such, this article contributes a great foundation for appropriate design of user experiences augmented by this oft-neglected modality.
(http://dx.doi.org/10.1145/2829944).

A final article presents the first large-scale study of real-world mass interactions in social TV, by studying the key motives of users for participating in side-channel commentaries when viewing major sporting events online. The large scale of the study (analysis of nearly 6 million chats, *plus* a survey of 1,123 users) allows the investigators to relate these motives to diverse usage patterns, leading to practical design suggestions that can be used to support user interactions and to enhance the identified motives of users—such as emotional release, cheering and jeering, and sharing thoughts, information, and feelings through commentary.

On a personal level, as a long-time resident of Seattle, I certainly could have benefitted from these insights during last year's Super Bowl—where, yes, in the armchair-quarterback opinion of this Editor-in-Chief, the ill-fated Seahawks should indeed have handed the ball to Marshawn Lynch.

Alas. There is always next year.
(http://dx.doi.org/10.1145/2843941).

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That's the spotlight—and the rest of the great content—for Issue 23:1. I'll be back in two months with some thoughts on the lineup for our April issue.

I can hardly wait to find out myself, since we only have a couple of acceptances lined up as of this writing.

But I always know some more wonderful contributions will come through the pipeline by the time we go to press with our next issue.

That's just one of the rewards of captaining this huge cruise liner known as TOCHI. We never quite know what exotic and intellectually stimulating port we'll pull in to next (grin).

Ken Hinckley

Editor-in-Chief

Redmond, Washington
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