The Editor's Spotlight: TOCHI Issue 24:3

Jetsetter. I'm about to hop on an airplane—bound for Denver and the CHI 2017 Conference, the major annual shindig of the field—under the (recently unreliable) assumption that the airline seat that I paid for will actually end up being mine. Oh, and I live in one of those states where I will soon have to show my passport (my driver's license deemed no longer adequate) to travel within my own country.

Nonetheless, should I have the good fortune to arrive in Colorado unscathed, I look tremendously forward to seeing all the latest developments in the field, not to mention grabbing a few beverages with old friends—and hopefully, a great number with new ones as well (grin).

The Editorial Board, Well-Represented. I'm particularly looking forward to our annual meeting of the TOCHI Editorial Board, where (among other more mundane business) we will have the opportunity to celebrate some major career awards that the SIGCHI community has bestowed on several of our Associate Editors.

—Jakob O. Wobbrock of the University of Washington, in a rare distinction, has been recognized with a Social Impact Award for his long-term research on improving input methods for all, particularly through the pursuit of “Ability-Based Design,” where the human abilities required to use a technology in a given context are questioned, and systems are made operable by or adaptable to alternative abilities.

And, three of our board members were inducted into the vaunted CHI Academy, which recognizes leaders in the field of human-computer interaction:

—Marti A. Hearst, of the University of California, Berkeley, was recognized for her contributions to user interfaces for search, information visualization of text, web site usability, and innovation in education. Marti was an early proponent of faceted navigation, now the gold-standard of search interfaces for e-commerce, digital libraries, and image collections—key innovations that we have taken for granted for a decade.

—Gloria Mark, of the University of California, Irvine, was recognized for her broad and deep work on the impact of digital media on people's lives, including multitasking, mood, and behavior while using digital media in real-life environments. Gloria has also contributed to a deeper understanding of distributed collaboration, as well as social media use among people living in disrupted environments.

—Paul Resnick, of the University of Michigan School of Information, was recognized as a pioneer in the field of recommender systems (sometimes called collaborative filtering). And Paul's current research focuses especially on socio-technical approaches to reducing political polarization—a topic in which it seems the world's democracies very much need enlightenment, given current trends.

You can read more about all of these awards at <http://www.sigchi.org/about/awards/2017-sigchi-awards>.

A Fresh Infusion of Wisdom. Given the burgeoning submission stream to the journal, I am especially pleased to announce a rejuvenation of the TOCHI Editorial Board in the

person of three distinguished new Associate Editors, because quite frankly we urgently require their efforts and expertise. So please do join me in offering a warm welcome to

- Caroline Appert (Univ. Paris-Sud and CNRS);
<https://www.lri.fr/~appert/website/index.html>
- Shamsi Iqbal (Microsoft Research); and
<http://research.microsoft.com/en-us/um/people/shamsi/>
- Carman Neustaedter (Simon Fraser University).
<http://carmster.com/>

They have each already made great contributions to the journal as they come on board and wade into their first series of manuscripts, and early returns promise that they will all serve the community for many years with great distinction.

An EPIC Development. As it so happens, I also have bit of news to report regarding Your Friend and Humble Editor-in-Chief, being as it may that I have founded a new group at Microsoft Research.

This team, known as EPIC (Extended Perception, Interaction, & Cognition), empowers people to visualize and interact with the world through technology.

If you are so inclined you can read a bit more about our ambitions for the future of human-computer interaction at <http://aka.ms/epic-research>.

IN THE SPOTLIGHT: MOTION CORRELATION AS A NEW FUNDAMENTAL TOOL FOR INTERACTION DESIGN

This month I experienced the delight of being surprised by a familiar concept.

Powerful socio-technical trends toward mobility have fragmented computing into varied devices and form-factors—some situated at particular locations in the environment, others held close at hand—ushering in new ways of interacting with technology that reflect the multiple, complementary modalities of natural human discourse.

From smart watches and displays with eye-tracking, to gaze in smart environments and gesturing at large displays from a distance, these emerging computational experiences afford new ways of conveying our intentions to computers, confronting would-be explorers with an exciting new frontier in human-computer interaction.

But to tame this Wild West, the designer must become a wrangler of new modalities, and to do so requires having enough tools of interaction design at one's disposal to avoid becoming a one-trick pony, as it were.

And as this insightful TOCHI article makes apparent, the principle of *motion correlation* offers a surprisingly useful general-purpose tool in this regard.

By “motion correlation” what is generally meant is some sort of correspondence between inputs along two or more channels. A simple example from everyday life would be clinking wine-glasses together for a toast. This human gesture of comradery is defined by the mutual raising of hands, the coming together of the stemware, and the resonant ring of the glass.

Now I must admit, I did some early work (circa 2003) along these lines, looking at how just such a gesture can be used as a natural way to link together mobile devices.

So I was really blown away when this TOCHI contribution took the concept and ran circles around every preconception I'd had about the scope of its utility. For example, the authors show a deviously clever use of motion correlation to afford rapid and precise eye-tracker calibration by pursuit tracking of a moving target on the screen. This tremendously simplifies, and indeed makes enjoyable for users, a tedious and demanding calibration procedure that would otherwise be necessary for accurate

eye-tracking—an under-appreciated difficulty with the modality that has limited its practical use.

Likewise, one might interact with a wearable such as a smart watch simply by moving the device in different patterns that synchronize with on-screen graphical feedback. Instead of trying to poke at an absurdly small touch screen, synchronous motion can easily and accurately select from a number of options.

And for screens that are out of reach, one target among many on the screen can be indicated simply by making a corresponding motion. This sidesteps the well-known difficulties (and inaccuracies) inherent in pointing at a distant display.

The authors give five examples of well-conceived and implemented techniques along these lines, drawing out key insights and design principles for each in a clear and organized manner.

Even though I would have considered myself an expert in this subject matter going in, I tremendously enjoyed reading this article, learned far more than I anticipated, and would highly recommend it to any aspiring sommelier of interaction design with modern modalities.

Eduardo Velloso, Marcus Carter, Joshua Newn, Augusto Esteves, Christopher Clarke, and Hans Gellersen. 2017. Motion Correlation: Selecting Objects by Matching Their Movement. ACM Trans. Comput.-Hum. Interact. 24, 3, Article 22 (April 2017), 35 pages. DOI=<http://dx.doi.org/10.1145/3064937>

OVERVIEW OF VOLUME 24, ISSUE NUMBER 1: THE INFLUENCE OF GEOGRAPHY ON THE SHARING ECONOMY, PLAY (TRANSFORMATIVE, SOCIAL, AND OTHERWISE), AND GAZE-CONTINGENT AUDITORY DISPLAYS IN VR

As always the journal touches on an amazing diversity of topics, with new knowledge often forged through the combination of disparate sub-disciplines of human-computer interaction, and beyond.

It's one of the things that make the field unique: as a cross-disciplinary and multi-disciplinary endeavor, HCI always welcomes new topics with open arms so long as the focus remains on people, and how their lives can be influenced by technology.

And of course this issue is no exception.

Towards a Geographic Understanding of the Sharing Economy: Systemic Biases in UberX and TaskRabbit. This work is a wonderful example of HCI's propensity for unusual (but rich, complementary, and fruitful) combinations of disciplines. In this case, through the lens of the emerging area of "geographic HCI," this work demonstrates how key principles from the study of human geography (distance decay, structured variation in population density, mental maps, and spatial homiphily) manifest in sharing economy platforms.

Through in-depth analyses of the UberX and TaskRabbit platforms, the authors detail systematic geographical biases in patterns of user activity, even going so far as to demonstrate the first use in HCI of a statistical analysis method known as *spatial Durbin modelling* to account for the non-independence of proximal samples in a geographic data-set. And indeed, I strongly suspect this methodology will find application to other problems in HCI, where locality-of-reference type of effects could plausibly induce statistical quirks in a sample, making this a key contribution of the paper in and of itself.

The authors then top off these contributions with an excellent in-depth discussion on how such insights can influence the design of sharing economy platforms going forward.

(<http://dx.doi.org/10.1145/3058499>).

Gaze-contingent Auditory Displays for Improved Spatial Attention in Virtual Reality. The “cocktail party effect” is one of the many human skills that we all take for granted, a near-miracle of selective attention, which allows us—through localization and discrimination of the spectral cues—to attend to a single speaker in a room bustling with conversation.

This article contributes a new twist on this well-known effect, by combining it with gaze direction as sensed in virtual reality environments. Of course, in virtual environments it is hard to render the cocktail-party effect in spatialized audio with full effect, so the authors constructed a gaze-contingent environment that faded in speakers’ voices contingent on the current region of overt attention. Importantly, this allows users to attend to select voices but without the elimination of competing sounds elsewhere in the environment, suggesting that this could be a valuable augmentation for group social interactions (or simulations thereof) in virtual reality environments.

(<http://dx.doi.org/10.1145/3067822>).

A Quartet of Play: Transformative Play, Educational Play, Children’s Physical Strategies for Collaborating on Digital Tabletops, and Social Exertion Games. No less than four articles in TOCHI Issue 24:3 touch on some aspect of play, children, education, and games:

Designing for Transformative Play explores how designers can introduce structures into interactive experiences that invite appropriation and re-definition by players. This design strategy of “transformative play” builds on theories from anthropology, psychology, and play studies to show various strategies that turn players into co-designers through the mere act of playing.

(<http://dx.doi.org/10.1145/3057921>).

A second contribution, *Educational Game and Intelligent Tutoring System: A Classroom Study and Comparative Design Analysis*, extends this theme with a thorough analysis of how educational games compare to intelligent tutoring systems, including a balanced consideration of what features of the systems make them effective (or not) with respect to learning, enjoyment, and self-assessment. The result is a thoughtful reflection that spurs fresh ideas and insights on hybrid solutions that have the potential to combine the strengths of both approaches.

(<http://dx.doi.org/10.1145/3057889>).

Next, *Collaborating around Digital Tabletops: Children’s Physical Strategies from the UK, India and Finland* convincingly demonstrates that designers must consider the worldwide heterogeneity of educational environments when designing collaborative educational experiences. This underscores how important it is to obtain a detailed understanding of the truly diverse collaboration strategies and behaviors of children on interactive tabletops, rather than (as it all too often the case) simply assuming that a sample drawn from a population in a high socio-economic status area of a single country should reveal universal collaborative behaviors of children.

(<http://dx.doi.org/10.1145/3058551>).

Finally, *Designing for Bodily Interplay in Social Exertion Games* presents an interesting exploration of two broad categories of bodily interplay, parallel and interdependent play, to illuminate new possibilities for both independent social exertion experiences as well as competitive offensive/defensive experiences (along the lines of a boxing match, or setting a screen in basketball). The work therefore identifies several under-explored areas of a rich design space that promises to combine the benefits of exertion games with the benefits of socially motivated engagement.

(<http://dx.doi.org/10.1145/3064938>).

Triumphant Return. As I conclude my remarks here, I'm just back from #CHI2017 (holy cow, what a whirligig of activity, my brain is on a spin cycle that spans half a continent, not to mention its immense zones of time. . .)

Upon my return my family's Fox Terrier/Maltese mix puppy-dog was a tiny white blizzard on legs, practically doing back flips trying to greet me at the door, and my kids put up a WELCOME HOME DADDY banner to greet me in the stairwell.

I grabbed them some light-up yo-yo's from the Microsoft booth schwag, which were greeted with shouts of glee, and I even had a CHI 2017 Honorable Mention Award in tow—for my team's work on large-screen interaction in a system known as *WritLarge*—to show for my travels.

Not too shabby for good week's work.

And so now I return my attention the TOCHI queue, a never-slacking fount of fresh insights, to see what might be the next great contribution to spring forth. I am a bit behind on that duty at the moment, while submissions, of course, are a wee bit ahead of last year's record pace. Constitutional crises can take a back seat for a moment. Science marches on, and onward we go.

Ken Hinckley
Editor-in-Chief

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