TEI '10

Proceedings of the 4th International Conference on Tangible, Embedded and Embodied Interaction

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MIT Media Lab | Cambridge, MA USA

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Foreword

The introductions to a thousand ACM conference publications start in the same way. The authors write: "the world is changing, computers are changing, the future is looming" in the first sentence. Then they present their vision.

We have the honor to present a conference – a young conference, full of energy – working to amplify these visions so that others may see them. In building TEI'10 to be such an amplifier our goals were to continue the tradition of strong academic work at TEI and also to bring in the designers, artists, inventors, makers, thinkers, and independents who have normally been left out of the ACM's sphere, because, just as the authors write, the world is changing, computers are changing, and the future is looming. Conferences must change as well.

We chose a theme for TEI'10: DE-FORM, IN-FORM, RE-FORM. We draw the focus to *form*: our field's combined mortar, pestle, *and* precious herbs. We kept TEI single track and started three new forums: *Explorations*, *Studios*, and the *Graduate Student Consortium*. We invited two amazing speakers – architect John Frazer and artist Vik Muniz – to delight, inspire, and remind us that what we do is about people, not technology. These changes resulted from the work of many people who deserve sincere gratitude.

TEI'10 is the product of hours of unpaid, often thankless work from thirty exceptional chairs and co-chairs, some of whom have been working for over a year to make this event possible. The general co-chairs Hiroshi Ishii, Robert J. K. Jacob, and Pattie Maes and the program co-chairs Thomas Pederson, Orit Shaer, and Ron Wakkary have worked tirelessly, and have done so from the start. As has treasurer Lisa Lieberson, little would have gotten done without her multiform efforts.

We owe a great debt to our corporate supporters: our Champions Hallmark and Crayola, and our Benefactors Microsoft Research Cambridge and Oblong Industries. Their partnership has been essential and we hope that this is the beginning of a long and beneficial relationship between us.

For the first time this year TEI is an ACM SIGCHI sponsored conference, we have Philippe Palanque and the staff at the ACM to thank for making this happen. This sponsorship will help ensure TEI's future and is the result of efforts since 2007 from TEI's prior chairs and the TEI steering committee; they have made this conference into what it is today.

In the end it is for the authors and their visions, that all of this is done.

Marcelo Coelho
TEI'10 Conference Co-Chair
MIT Media Lab
Cambridge, Mass. USA

Jamie Zigelbaum
TEI'10 Conference Co-Chair
MIT Media Lab and Oblong Industries
Los Angeles, Cali. USA

Welcome to the TEI'10 Proceedings

We welcome you to the proceedings of the *4th ACM International Conference on Tangible, Embedded, and Embodied Interaction – TEI'10,* held in Cambridge, Massachusetts, on the 25th -27th of January 2010.

TEI'10 continues the pursuit of key areas of innovation in respect to tangible, embedded, and embodied interactions. These concerns include the interlinking of digital and physical worlds through tangible and embodied interaction and the computational augmentation of everyday objects and environments in new ways through embedded technologies. Research and practice in these innovative areas lead to works of tangible interfaces, graspable interfaces, physical computing, whole-body interaction, gesture-based interfaces, and interactive surfaces. Designing such systems requires interdisciplinary thinking as their creation not only encompasses software, electronics, and mechanics, but also form, aesthetics, and social impact. The high quality, original, and diverse works in these proceedings is a testament to the growth and importance of the field of *tangible computing*.

The call for papers attracted 160 submissions from approximately 20 countries spanning Africa, Asia, Canada, Europe, and the United States. All submissions were peer and blind reviewed and received at least three independent expert reviews. In total, 54 papers were accepted for an acceptance rate of 34%. The papers are a mix of 2, 4, 8 pages in length. From these contributions, the program at the conference includes 16 long talks, 8 short talks, 1 short talk and a demo, 22 demos, and 7 posters. We are proud to continue the tradition of a plenary session for all talks, demos and posters. The paper sessions are organized along five themes. *Bridging the Physical and Digital Worlds* is at the center of tangible computing investigations that explore the intersections of computation and physicality. *Toolkits and Enabling Technologies* explores the functionality of applications and technologies for users and the tools for designers and developers. *Physical Interactions, Perspectives, and Design Techniques* represent the emerging and refined thinking in the field that investigates embodiment, reflections and frameworks, and emerging techniques. *Materials, Garments and Lights* uncovers the serious investigations into new materials and expressions for tangible computing. Lastly, *Learning through Physical Interaction* contributes to the invaluable intersections between tangible computing and learning. In addition, the demonstrations and posters session gives concrete and vibrant evidence for the serious and diverse research in the field.

We are also proud to include innovations in the conference program this year. A new track was created known as *Explorations* aimed at attracting thought provoking, evocative, visually and sensually rich work by a diverse group of creators. 46 submissions were received from which an expert jury accepted 10 contributions. These contributions are interwoven into the papers and demonstration tracks at the conference. Another new track is *Studios,* a series of 21 workshop sessions open to all conference participants that offer novel hands-on experiences ranging from the exploration of new development toolkits, to prototype design techniques, and the use of emerging or traditional materials in creatively applied way. Lastly, the *Graduate Student Consortium* reflects the essential need for the participation and development of new scholars in the areas of tangible computing. 38 submissions were received and 13 contributions were accepted after blind reviews by at least three independent and expert reviewers per submission.

Putting together the program and proceedings was a team effort. First of all, we would like to thank the authors for their outstanding research and contributions. We would like to express our deep gratitude to the program committees, juries and external reviewers across all tracks, who worked tirelessly in reviewing papers and providing suggestions for their improvements. We would also like to thank Jon Kolko and Thecla Schiphorst, the Explorations Co-Chairs, Amon Millner and Jay Silver, our Studios Co-Chairs, and Mark Gross, our Graduate Student Consortium Chair. Special thanks to all of those on the Organizing Committee, Adrienne Griscti at ACM, and Lisa Tolles of Sheridan Printing for invaluable assistance in putting together the proceedings.

Thomas Pederson
TEI'10 Program Co-Chair
IT University of Copenhagen, Denmark

Orit Shaer
TEI'10 Program Co-Chair
Wellesley College, USA

Ron Wakkary
TEI'10 Program Co-Chair
Simon Fraser University, Canada

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Session Chair: Thecla Shiphorst *(Simon Fraser University)*

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