





# WWW2010

APRIL 26-30 • RALEIGH • NC • USA

Raleigh Convention Center



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## Welcome to the Compilation E-Proceedings of the 19th International World Wide Web Conference & the 3rd Workshop on Information Credibility

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## Message from the General Chairs

Welcome to the Nineteenth International World Wide Web Conference in the “City of Oaks,” Raleigh, North Carolina!

The road to Raleigh has been in the works for three years, and getting here has involved the hard work and dedication of many individuals, beginning with the Chair of the Local Arrangements Committee, Kathy Green. Kathy co-developed and presented the initial Raleigh site proposal in Banff at WWW2007. After Raleigh was designated the site for WWW2010, she worked tirelessly to channel the cumulative efforts of hundreds of conference committee members, guiding the process every step of the way. Kathy’s role as the central node in a large network of individuals and organizations—including the Program Committee, the conference management company (YCC), the Raleigh Convention Center, the ACM and its publishing company, sponsors and many more—was pivotal to the success of the conference.

Thanks also to the members of the IW3C2 and its site visitation subcommittee for their confidence in the Raleigh-based team and their guidance along the way. Special thanks to Vincent Shen, who on a coincidental visit to Raleigh way back in 2000, initiated the conversation about hosting WWW, and to Bebo White, our liaison to the IW3C2, a native “Tar Heel” who supported the Raleigh proposal from the start, and who kept the idea alive in the days before we believed it was possible.

The quality of the technical program owes much to the dedication of the Program Committee chairs, Juliana Freire and Soumen Chakrabarti. Juliana and Soumen brought their enthusiasm and experience to the challenging task of selecting the very best work from hundreds of submissions. With a keen focus on process improvement, they led the efforts of 43 committee chairs and no less than 376 members to deliver a superb 5-day program including 10 workshops, 11 tutorials, 105 technical papers, and 90 posters.

WWW2010 would not be possible without the support of the host institutions, North Carolina State University and the University of North Carolina at Chapel Hill. Thanks to colleagues on both campuses who came together to help make this week in Raleigh a success. Thanks also to our sponsors; their continued support is critical to the sustainability of the conference series.

We have the privilege of hosting WWW2010 in the beautiful new Raleigh Convention Center—which was still under construction when the site proposal was made. Our sincere appreciation goes to the convention center management team, which worked with us from the beginning to ensure a successful conference.

To the aforementioned individuals and many, many more, please know that your contributions to WWW2010 are sincerely appreciated.

General Co-Chairs

**Michael Rappa**

*North Carolina State University*

**Paul Jones**

*University of North Carolina at Chapel Hill*



## Message from the Chair of IW3C2

### *This green plot shall be our stage*

On behalf of the International World Wide Web Conference Committee (**IW3C2**), the steering committee for this conference series, I welcome you to the 19<sup>th</sup> conference of our series. As you already know, the World Wide Web was first conceived in 1989 by Tim Berners-Lee at CERN in Geneva, Switzerland. The first conference of the series, WWW1, was held at CERN in 1994 and organized by Robert Cailliau. The IW3C2 was founded by Joseph Hardin and Robert Cailliau later in 1994 and has been responsible for the conference series ever since. I have personally been lucky enough to be part of this community since WWW2, when I co-authored a poster. After 1994 and 1995 (when two conferences were held each year), WWW $n$  became an annual event held in late April or early May.

The location of the conference generally rotates among the Americas, Europe, and Asia/Pacific. In 2001 we changed the conference designator from a number (1 through 10) to the year it is held; i.e., WWW11 became known as WWW2002. You may browse our website <http://www.iw3c2.org/> for information on past and future conferences. **WWW2014 is now open for bids**, preferably from a host in Asia/Pacific. We encourage you to point interested parties to the “Host a Conference” section of the IW3C2’s web site.

The International WWW Conference series provides the world with a premier forum about the development of the Web, the standardization of its associated technologies, and the Web’s impact on society and culture. These conferences bring together researchers, developers, users, and vendors – indeed all of you who are passionate about the Web and what it has to offer, now and in the future. Part of what is exciting about this series is the cross boundary and eclectic nature of the topics covered, and the opportunity it provides for exploration of new directions, both technological and social.

We appreciate the cooperation of ACM which makes our conference the best in the Web area. We also wish to recognize our long-term associate, the World Wide Web Consortium (W3C).

We are excited about the opportunity to bring the web community to Raleigh, North Carolina, to share the food, sports, and culture of this beautiful city with all of you. We thank NC State University and The University of North Carolina at Chapel Hill who serve as our gracious hosts, and the general chairs Michael Rappa and Paul Jones, and local arrangements chair Kathy Green, for all their hard work. Let us all take this opportunity to learn new things in technology, in culture, and in business, from each other!

**Mary Ellen Zurko**  
*IBM Software Group*



## Message from the Program Chairs

Welcome to the World Wide Web Conference held during April 26-30, 2010, at the Raleigh Convention Center in Raleigh, North Carolina, USA. The WWW Conference is the largest and premier annual forum where researchers and developers from around the world assemble to share, discuss and debate the latest developments on Web technologies and standards and the Web's impact on society and culture. We are pleased to present the proceedings of the conference as its published record.

Based on input from several office holders in recent WWW conferences, we implemented a number of modifications in the review process this time. In earlier years, WWW used a partitioned track system, and each paper was sent to exactly one track. This year, we implemented a system of overlapping (broad) areas and (fine) topics. Each broad area was represented by at least two, but often more, area chairs (ACs), who helped recruit the rest of the program committee (PC) members, but PC members were not partitioned by area.

Each paper could potentially be assigned to any PC member. We downloaded a number of recent papers by each PC member to create a profile, and used its similarity with each submitted paper as one signal into the paper assignment process, while paying close attention to bids for papers by PC members. The assignments were then fine-tuned by the ACs. Each paper was first reviewed by three PC members. Then the ACs initiated discussions, solicited additional reviews if needed, and wrote at least one meta-review per paper summarizing and justifying the final decision.

For most papers, the ACs had a confident decision before the PC meeting held 14-15<sup>th</sup> January. At this meeting, particularly complicated decisions were made and reviewed. Overall, we believe the two-tier review process ensures in-depth, reliable and fair evaluations.

Other new features include a new demo track, where anyone, not just industrial exhibitors, can show a working system, and a new category of Application and Experience (A+E) papers that were reviewed for merit in design, implementation, benchmarking or extensive experience, as distinct from a core technical idea as in regular research submissions. Some A+E papers were nominated for demos. Other tracks for posters, tutorials, workshops, and developers were run as usual, separate from the research track.

754 research papers were submitted. Of these, 91 were accepted as regular research papers and 14 were accepted as A+E papers. A total of 24 tutorials were proposed and 11 accepted. A total of 19 workshops were proposed and 11 were accepted. A total of 90 posters and 27 demos will be exhibited.

We thank a large number of people without whose contribution this large effort could not have been successful: the authors, for high-quality submissions, the PC members and external reviewers, for careful reviews, the ACs, for extensive discussions and decisions, the track chairs for A+E papers, demos, posters, tutorials, panels and workshops, the General Chairs and local organizers, IW3C2 for guidance, and ACM's proceedings production team.

We are honored to serve the Web community through this exciting technical program, and hope that it will stimulate discussion, innovation and collaboration in Web technologies, and provide practitioners with better techniques, tools and standards.



**Juliana Freire**  
*University of Utah*



**Soumen Chakrabarti**  
*Indian Institute of Technology*



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