The 13th Web for All Conference Montreal, Canada 2016

http://www.w4a.info/2016

#w4a2016
Endorsed by the IW3C2
International World Wide Web Conference Committee

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Montreal, Canada 2016
Forward

The International Web for All Conference (W4A) began in 2004 as a workshop aiming to make the World Wide Web accessible for people with disabilities. Over the next ten years, the workshop grew into the top conference for web accessibility research, attracting a diverse crowd from academia, industry, government, and non-profit organizations. W4A has become the venue for scientists, students, and practitioners from around the world to showcase their latest research, widen their perspectives through discussions with their peers, and establish future research agendas.

W4A is an influential conference that has a growing impact on the research community. According to the ACM Digital Library Bibliometric, each of the W4A's 324 papers was downloaded on average 380 times and has 4.17 citations. These data confirm that W4A does not only provide excellent visibility to papers but also enables strong scientific impact.

Every year, we select a theme that reflects the emerging trends in web accessibility and encourages researchers to look for innovative solutions that make the Web accessible for all. The rapid emergence of online learning has brought many accessibility challenges. MOOCs, Big Data, and Open Content are changing how we look at education, broadening access to learning for millions, soon billions of individuals, and creating new opportunities to remove barriers to literacy, education, and the search for knowledge. With the explosive growth of opportunities to learn online, the theme of the 13th International Web for All Conference is “Education for All on the Web.”

This year, we received 44 submissions from thirteen countries showing steady interest of the research community. The submissions covered a wide range of topics including wearable and mobile interfaces, adaptation, web browsing and personalization, education, standards and guidelines, and others. Seven technical papers (36%) and twelve communication papers (48%) were selected through a rigorous peer review process.

This year, W4A will feature two keynote speakers. Jutta Treviranus, Director of the Inclusive Design Research Centre (IDRC) and professor at OCAD University in Toronto and Jennison Asuncion co-founded Global Accessibility Awareness Day in 2012.

Many people have contributed to the success of this conference. We would like to thank the program committee for their exceptional work and dedication in the review process. We would also like to thank the authors for their excellent work and thank delegates for their participation. Finally, we would like to thank our sponsors and supporters: Google; IBM; Intuit; The Paciello Group; Canvas; Capti; ATutorSpaces; OpenConf; ABILITY Magazine; ACM Digital Library, ACM SIGACCESS, ACM SIGCHI, ACM SIGWEB; and WWW 2016.

Luz Rello and Vivienne Conway
April 2016.

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Conference Program

Sunday April 10, 2016 (pre-conference)

- W4A/Google Doctoral Consortium (at UQAM) (1:00 - 6:00)

Monday April 11, 2016

- Opening (8:40 - 9:15)
- Keynote (09:15 - 10:30) Jutta Treviranus, OCAD University
  ○ Life-Long Learning on the Inclusive Web
- IBM Award for Students with Disabilities (11:00 - 11:40)
- Session 1: Accessibility Challenges (11:40 - 12:30)
- Session 2: Web Accessibility (2:00 - 2:30)
- Session 3: TPG Web Accessibility Challenge Presentations (2:30 - 3:30)
- Session 4: TPG Web Accessibility Challenge Demos & Voting (4:00 - 5:30)

Tuesday April 12, 2016

- Session 5: Non-Visual Access & Web Accessibility (8:45 - 10:00)
- Session 6: Doctoral Consortium Presentations (10:00 - 10:30)
- Session 7: Accessible Learning, Web-based Testing and Assessment (11:00 - 12:30)
- Session 8: Supporting Accessibility and Wearables (2:00 - 3:00)
- Session 9: Doctoral Consortium Presentations (3:00 - 3:30)
- Session 10: Accessible Multimedia (4:00 - 5:15)
- Awards and Closing (4:45 - 5:00)

The "William Loughborough" After Dinner Talk (Jennison Asuncion) (7:00)

Wednesday April 13, 2016

1. WWW Keynote with Tim Berners Lee (9:00 - 10:30)

2. WWW/W4A Accessibility Hackathon (at Google Montreal) (11:30 - 6:00)
   or
2. W4A Camp (11:00 - 6:00)
Conference Information

Publications
Conference proceedings have the ACM ISBN 978-1-4503-4138-7 and include abstracts and notes sections for all our technical, communications, challenge, doctoral consortium and keynote presentations. The conference proceedings will be published as part of the ACM International Conference Proceedings Series and will be available at the ACM Digital Library.

History
W4A was established in 2004 as a cross-disciplinary conference focusing on research in the area of the Web and accessibility, primarily for people with disabilities. Since then, it has become an established part of the accessibility research calendar, taking place alongside the annual WWW conference. Every year, we welcome between 50-70 attendees, who come from a large number of research institutions around the world, including academia, industry, government, and disability support organizations.

Papers have been typically reviewed by at least three of our program committee members with an average acceptance rate of 35%. Papers of our conference are published in ISBNed ACM proceedings and in various Special Issues of respected journals within the field. We also solicit sponsorship from the ACM SIGACCESS, ACM SIGCHI, ACM SIGWEB, plus organisations including IBM Research, Adobe, Mozilla Foundation, Google, Microsoft, The Paciello Group, Zakon Group.

Past Conference Locations:

- W4A 2015, Florence, Italy
- W4A 2014, Seoul, South Korea
- W4A 2013, Rio de Janeiro, Brazil
- W4A 2012, Lyon, France
- W4A 2011, Hyderabad, India
- W4A 2010, Raleigh, NC, USA
- W4A 2009, Madrid, Spain
- W4A 2008, Beijing, China
- W4A 2007, Banff, Canada
- W4A 2006, Edinburgh, UK
- W4A 2005, Chiba, Japan
- W4A 2004, New York, NY, USA

Lunch and Coffee
The conference lunch and coffee will be held together with the World Wide Web (WWW) conference. The WWW morning coffee break is scheduled for 10:30-11:00, the lunch for 12:30-14:00 and the afternoon coffee break is scheduled for 15:30-16:00.
Jutta Treviranus is the Director of the Inclusive Design Research Centre (IDRC) and professor at OCAD University in Toronto. The IDRC (formerly the Adaptive Technology Resource Centre) conducts proactive research and development to support digital inclusion and inclusive practices and policies in our digitally transformed society. Jutta also heads the Inclusive Design Institute, a multi-university regional centre of expertise on inclusive design. Jutta is the Co-Director of Raising the Floor International. She established an innovative graduate program in Inclusive Design. Jutta has led many international multi-partner research networks that have created broadly implemented technical innovations that support inclusion. These include the Fluid Project, Fluid Engage, CulturAll, Stretch, FLOE and many others. Jutta and her team have pioneered personalization as an approach to accessibility in the digital domain. She has played a leading role in developing accessibility legislation, standards and specifications internationally (including WAI ATAG, IMS AccessForAll, ISO 24751, and AODA Information and Communication).
Jennison Asuncion
The William Loughborough After-Dinner Speaker

Jennison Asuncion co-founded Global Accessibility Awareness Day in 2012. GAAD is an annual, grassroots effort that invites the broader high-tech community to engage in in-person and virtual activities meant to raise the visibility of digital inclusion. Jennison launched Accessibility Camp Toronto in 2011, Accessibility Camp Bay Area in 2014, and helped found the Boston Accessibility Conference and accessibility Camp L.A. in 2010 and 2012 respectively. These free, day-long events intentionally provide a less formal atmosphere for designers, developers, other tech pros, and people with disabilities to discuss digital accessibility issues.

Jennison spent almost seven years on the Royal Bank of Canada’s IT Accessibility Team. He currently leads LinkedIn’s accessibility efforts. As Co-Director of the Adaptech Research Network, Jennison has been publishing and presenting on ICT accessibility in Canadian postsecondary education since 1999.

For his combined professional, research, and volunteer efforts, in 2012, Jennison was recognized with a Queen Elizabeth II Diamond Jubilee Medal.
The W4A/TPG Web Accessibility Challenge has been generously sponsored by The Paciello Group, and is offered as a medium for researchers, web developers and software engineers to showcase new and innovative technologies in the area of Web accessibility.

The W4A/TPG Web Accessibility Challenge consists of two prizes: the Judges Award and the Delegates Award. The Judges Award is awarded by a panel of recognised experts from a wide range of sectors covering industry bodies and academic institutions. This year, we are honoured to have the participation of Shadi Abou-Zahra (W3C), David Sloan (The Paciello Group), Simon Harper (University of Manchester), Carlos Duarte (University of Lisbon) and Konstantinos Votis (CERTH/ITI). We’d like to take this opportunity to thank the distinguished judges for their contribution to the conference.

The Delegates Award is awarded by the delegates of the W4A Conference by secret ballot after listening to the Challenge presentations and being able to experience the solutions during a demonstration session. This is an interesting and exciting part of the W4A Conference, since authors can make their own case for the impact of their Accessible Technology and the results may be different from the Judges' decision.

Given that entries to the main track can also qualify for the Delegates Award, we received a total of 14 high-quality entries from across globe including representatives from Ecuador, Brazil, the United Kingdom, Australia, Spain, India, Tunisia, the United States, and Canada. The contributions focus on different areas of web accessibility, and, when examined as a whole, the solutions provide a collection of innovations that support the needs of a diverse range of users, fitting the ethos of the W4A Conference perfectly.

In general, all authors will receive valuable feedback from the conference attendees, and have the possibility of networking with individuals from industry, academia and regulatory and standards bodies regarding their technologies.

Chris Bailey
April 2016
The 2016 W4A Conference also features the second edition of the W4A Google Doctoral Consortium. As in the previous year we were generously supported by Google sponsoring the event, allowing us to give Doctoral Consortium Awards to talented students. The awards provided financial support for six students to attend the W4A Conference, present their research and gain valuable feedback from top researchers and practitioners in the field of Web Accessibility.

This year we received twelve submissions, leading to a highly competitive selection process for the six successful candidates. All submissions were thoroughly reviewed by the panel of expert judges and evaluated with respect to previously announced review criteria in terms of their relevance to W4A, overall awareness of their field, originality of the work and its potential impact.

The W4A Organizing Committee would therefore like to thank the judges for their dedicated effort and is happy to introduce the 2016 participants in the Doctoral Consortium:

- Michael Cormier, University of Waterloo, Canada
- Maria Rauschenberger, Universitat Pompeu Fabra, Barcelona, Spain
- Neil Rogers, University of Southampton, UK
- Julio Vega, University of Manchester, UK
- Flynn Wolf, University of Maryland, Baltimore County, USA
- Xing Yu, Indiana University, Indianapolis, USA

The Doctoral Consortium session will be held the day before the main conference. Students present their research to the Doctoral Consortium Panel comprised of Chris Bailey (Vodafone Group), Hironobu Takagi (IBM), Yu Zhong (Google) and chaired by TV Raman of Google. In addition, all students will give short presentations of their work during the main conference and their extended abstracts are included in these proceedings.

Once again, we are most thankful to Google Inc. for their generous support, and we look forward to their ongoing involvement in W4A.

Erin Brady and Volker Sorge
April 2016

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WWW/W4A Accessibility Hackathon

We are very excited to announce that this year WWW and W4A are joining forces to run the first WWW+W4A Accessibility Hackathon being put on by Google Montreal and the Partnership on Employment & Accessible Technology (PEAT). The aim of the hack is to take a popular product that is being used widely across the Web in workplaces and schools and make it accessible. This venture will combine the expertise of WWW web developers with the expertise of W4A accessibility researchers to produce software that can be used by anyone regardless of ability, and regardless of the technology they may be using to access the Web.

Time & Place
Location: Google Montreal offices (1253 Ave McGill College #150)
Date: Wednesday April 13, 11am to 6pm (following the WWW Keynote)

The Focus
This year our focus will be on the popular, open source H5P interactive content objects. With H5P, authors may create and edit interactive videos, presentations, games, advertisements and more.

H5P can currently be integrated with Drupal and WordPress, and will be available for a wide range of learning and content management systems through LTI (IMS Learning Tool Interoperability) in a release coming soon. Integration for Moodle, currently under development, may be available.

How it Works
Participants will be split into groups of 5 to 7 people, each group to focus on a specific element of H5P. We will aim to evenly distribute WWW and W4A members across groups, and group those with complementing interests and backgrounds. Designers, coders, accessibility experts, and people with disabilities are all encouraged to get involved.

- 11:30 am to 11:45 am: Program description and direction
- 11:45 am to ~4:30pm: Hack (Pizza will be served for lunch while you work)
- 4:30pm to 5:45pm: Lightning presentations (10 groups x 6 minutes max)
- 5:45pm to 6:00pm: Awards

Signup
Attendees who are registered for WWW or W4A are eligible to participate as part of their conference experience at no extra cost. Space is limited to 60 hackers, so be sure to sign-up early to secure your spot. Visit the W4A 2016 website for additional details and to signup http://www.w4a.info/2016/wwww4a-hackathon/
Signup for the WWW/W4A Hackathon

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For those who are not attending the WWW/W4A Accessibility Hackathon at Google Montreal on Wednesday April 13, W4A Camp is a great alternative.

In 2012, we introduced W4A Camp, a half-day anarchic event to discuss and learn about accessibility research. W4A Camp takes place on the Wednesday of the conference, following the WWW Keynote address by Tim Berners Lee. It gives delegates an opportunity to discuss any topics they want. It’s a great place for discussing work, ideas, research collaborations, demoing projects, giving advice to PhD students, hearing from IBM PwD awardees, discussing papers, or looking at what went wrong with your submission this year!

It will be exciting and productive with just a little structure; you choose the topics, the presentations, and the threads for the camp. During the first two days, delegates will propose themes, join existing themes, or will merge themes which are similar. Then, we decide the general themes – the rest is up to us all together!

How Will We Proceed?

If you are not participating in the WWW/W4A Accessibility Hackathon: before and throughout the conference share ideas using the Twitter #w4acamp hashtag, and during the conference add ideas to the camp post-it wall. If there is enough interest, we will decide on themes and topics. W4A Camp starts after the WWW Keynote, in parallel with the hackathon.

Remember the W4A Camp is an unconference, so bring your demos, projects, half-baked research ideas, and your sense of inquiry. Don’t have a project? No worries; we’re looking for collaborators. There will be a wall for post-its and a camp grid over the main W4A conference days and we’ll post this on our social channels – so you can turn up even if you are not at the W4A.

W4A Camp is an ad-hoc unconference born from the desire for people to share and learn in an open environment. It is an intense event with discussions, demos and interaction from attendees. Anyone with something to contribute or with the desire to learn is welcome and invited to join. When you come, be prepared to share with W4A Campers. When you leave, be prepared to share it with the world.

No Spectators, Only Participants
This is the 2nd year that W4A is able to grant qualifying students the IBM People with Disabilities Award. This year, we received 8 strong applications, but only four winners will receive the award, which will reimburse all their attendance costs. The awardees will be introduced to the community of W4A researchers and practitioners who are working to make Web, Mobile, and Wearable devices accessible for all. We thank IBM for their generous sponsorship and hope to see more submissions in 2017.

Chieko Asakawa and Yevgen Borodin
April 2016
Life-Long Learning on the Inclusive Web

Jutta Treviranus, Inclusive Design Research Centre

If our formal education systems were to be graded on achieving the following assignment: “to enable all students to reach their diverse, full potential, so that they can be prosperous, self-guided contributors to our global community,” our systems of education would be flunking. The impact of this failure will exponentially worsen over time, given socio-technical trends. To achieve this crucial learning goal we need more than incremental improvement. We need disruptive innovation. Can the Web be the disruptive impetus and generative scaffolding for an education system that can achieve this goal? How can we both reform and leverage Web accessibility approaches to support this mission? These are the questions explored in this article. Complex adaptive systems, emerging decentralized systems of trust, “small” and “thick” data analytics, Internet of things sensing, open platforms, but most importantly -- connected communities, are all recruited in the thought experiment to craft a candidate response.
IBM People with Disabilities Award

The W4A Organizing Committee is happy to introduce the 2016 winners:

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<tr>
<th>Name</th>
<th>University/College</th>
<th>State</th>
<th>Country</th>
</tr>
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<tbody>
<tr>
<td>Lourdes</td>
<td>University of California, Santa Cruz</td>
<td>CA</td>
<td>USA</td>
</tr>
<tr>
<td>Philbert</td>
<td>Pasadena City College</td>
<td>CA</td>
<td>USA</td>
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<tr>
<td>Ashley</td>
<td>University of the Cumberlands</td>
<td>KY</td>
<td>USA</td>
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<tr>
<td>Cole</td>
<td>Carnegie Mellon University</td>
<td>PA</td>
<td>USA</td>
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Intuit and Canvas Student Awards

The 2016 Student Awards recipients are:

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<tr>
<th>Name</th>
<th>University/College</th>
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<tbody>
<tr>
<td>Linda DuHadway</td>
<td>Utah State University</td>
</tr>
<tr>
<td>Yashesh Gaur</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>Erin Buehler</td>
<td>University of Maryland, Baltimore County</td>
</tr>
<tr>
<td>Julia Mueller</td>
<td>University of Manchester</td>
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Vocational training of people with disabilities (PwD) can potentially improve social and economic prospects, but at the same time, it can be significantly challenging due to the need for specialized training and technology. Unfortunately, in developing countries this problem is magnified because, in general, low-income groups have limited access to appropriate content and assistive technologies. In this paper, we present initial findings from a qualitative field study of computer-mediated vocational training for low-income students with intellectual disability (ID) in Brazil’s largest urban area. The observations took place during 3 computer-based training sessions, which involved 23 students with ID. Based on data gathered from observations and semi-structured interviews with 2 instructors, we describe and discuss strategies they employ to teach heterogeneous groups of students with ID. We also examine some obstacles that our participants usually face during the classes at the computer lab and present suggestions for future initiatives that could better support instructors and students with ID in the learning process.
Exploring pedagogical culture for accessibility in education in Computing Science

Sarah Lewthwaite, University of Southampton; David Sloan, The Paciello Group (UK)

This paper identifies some of the challenges of teaching and learning accessibility through the lens of pedagogy (which deals with the theory and practice of education). We argue that accessibility education in computing science presents a set of unique and challenging characteristics for those engaged in accessibility capacity building. Significant moves are being made to embed accessibility within academic curricula and professional domains. However, through a qualitative thematic review of the accessibility pedagogic literature, we find that the field lacks the pedagogic culture necessary to support widespread excellence in teaching and learning. Nonetheless, our review identifies aspects of this small but important literature that indicate how a pedagogic culture for accessibility can be stimulated through research, debate and discussion, to promote a more pedagogically-grounded approach to the field as a whole.

Notes:
Towards Universal Rendering in MathJax

Davide Cervone, MathJax Consortium; Peter Krautzberger, MathJax Consortium; Volker Sorge, MathJax Consortium

Mathematics support on the web is currently very limited mainly due to the lack of browser support for the dedicated markup language MathML. While for visual display JavaScript libraries like MathJax can ensure flawless rendering of formulas across all platforms and browsers, there currently exists no system independent assistive technology solutions for Mathematics. We report on the attempt to transform MathJax into a universal rendering solution, providing accessibility also for readers with visual, print, and motor impairments. As our goal is to integrate seamlessly with other assistive technology solutions, we are faced with a number of technical challenges to provide a consistent user experience, regardless of the particular combination of platform, browser, and screen reader employed by readers. This paper presents MathJax’s accessibility features and some of the technical challenges to motivate a wish-list for future standards to enhance web accessibility for STEM content.

Notes:
Session 2: Web Accessibility

Web Accessibility Guidelines for the 2020s

Michael Cooper, W3C/WAI

W3C has completed the 2.0 versions of its three web accessibility guidelines addressing authoring, content, and user agents. It now is working to address new needs created by ongoing evolution of the Web. Using a user needs-focused approach it is developing technologies, techniques, and guidelines to make the Web accessible to people with disabilities.

Notes:
Development Technologies Impact in Web Accessibility

Carlos Duarte, Inês Matos, João Vicente, Ana Salvado, Carlos M. Duarte, Luís Carriço
LaSIGE, Faculdade de Ciências, Universidade de Lisboa

This paper presents a study assessing the effect of development technology choices on the accessibility quality of web pages. We used an off-the-shelf tool to identify technologies over a set of 1669 pages, each from a different domain. We have focused, in particular, in programming languages, Web and JavaScript frameworks, and content management systems categories. Simultaneously, we used an automatic accessibility evaluation tool to assess the accessibility of those pages. The study shows statistical evidence that some technologies lead to more accessible pages, within all categories.

Notes:
Presentation of Entrants to the 2016 W4A Web Accessibility Challenge
Award Sponsored by The Paciello Group

Challenge Details for Delegates
This year the W4A/TPG Web Accessibility Challenge will involve two activities:

- A five minute pitch presentation
- A five minute lightning demo

Presentation Session:
During a 5 minute presentation, each Challenge entrant will “pitch” their solution to delegates and articulate the innovative aspects of their technology and how it advances accessibility and usability. Their presentation will define the accessibility issue their technology solves, and describe the innovations one can expect to see during the demonstration session that will follow.

Presenters:
1. Accessible OzPlayer Video Player, Matt McLeod, Gian Wild (AccessibilityOz)
2. Contextual Language Learning with Capti ESL Assistant, Yevgen Borodin, Yury Puzis, Andrii Soviak, Andrii Melnyk, IV Ramakrishnan (Charmtech Labs LLC), Vikas Ashok (Stony Brook University)
3. NavCog: turn-by-turn smartphone navigation assistant for people with visual impairments or blindness, Dragan Ahmetovic, Cole Gleason, Kris M. Kitani (Carnegie Mellon University), Hironobu Takagi, Chieko Asakawa (IBM Research)
4. WebReader: a screen reader for everyone, everywhere, Aurelio De Rosa, Donovan Justice (Digital Detox)
5. Lake Devo: Accessible Online Role-Play, Greg Gay, Maureen Glynn, Naza Djafarova (Ryerson University)

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8. **Editor for Accessible Images in e-Learning Platforms**, Sandra Sanchez-Gordon, Juan Estevez (National Polytechnic School of Ecuador), Sergio Luján-Mora (University of Alicante)

9. **Accessible Map Visualization Prototype**, Tania Calle-Jimenez (National Polytechnic School of Ecuador), Sergio Luján-Mora (University of Alicante)

10. **Improving OER Websites for Learners with Disabilities**, Rosa Navarette (National Polytechnic School of Ecuador), Sergio Luján-Mora (University of Alicante)

11. **A Platform to Support Personalized Training for People with Disabilities**, Carlos Cardonha, Andrea Britto Mattos, Rodrigo Laioa Guimarães (IBM Research)

12. **Towards Universal Rendering in MathJax**, Davide Cervone, Peter Krautzberger, Volker Sorge, (MathJax Consortium)

13. **Learning Games for Cognitive Impaired People**, Maria Claudia Buzzi, Marina Buzzi, Eric Perrone, Beatrice Rapisarda, Caterina Senette (Institute of Informatics and Telematics, National Research Council)
Demonstrations and Voting Forum for the Delegates Award Sponsored by The Paciello Group

Demonstration Session:
To ensure the session can commence on schedule, please return from the break on time. Delegates will then be given a voting ballot paper, split into groups and assigned a station where they will start the demonstration session. When the bell rings, the presenter at the station will do his or her 5 minute demo of the innovative aspect of their technology. The presenter may or may not allocate time for questions during the session.

After five minutes the bell will ring again, at which time your group will move on to the next demo. This continues until all groups have visited all the demos. “Timekeepers” will be present who will facilitate the rotation between demo stations.

Voting
After your group has visited all the stations, using the ballot page you were given at the first station indicate your 1st (1), 2nd (2) and 3rd (3) choices to receive the Challenge Delegates award. Your decision should be made based on how well the presenter articulated and demonstrated how the technology innovates and advances accessibility and usability for its users’.

Submit your ballot page to the ballot box for counting by the end of the lunch break on the day following the challenge demonstrations (Tuesday 2pm). The Challenge Chair will indicate where and when this will be available. The scoring system for the Challenge is as follows:

- 3 points for each 1st place vote,
- 2 point for each 2nd place vote,
- 1 point for each 3rd place vote.

The technology with the most points will be the Delegates Award Winner. In the event of a points tie, the entrant with the most 1st placed choices will be considered the winner. If there is still a tie, Challenge Judges in attendance at the conference will make the final decision regarding the winner of the Delegates award.
Usability Evaluation of Two Virtual Aids to Enhance Cursor Accessibility for Motor-Impaired Users

J. Eduardo Pérez, Xabier Valencia, Myriam Arrue, Julio Abascal, University of the Basque Country (UPV/EHU)

Basic actions in the context of Web browsing, such as pointing at and clicking on links, can be seriously hindered by dexterity impairments affecting the use of hands and arms. In this paper, we present two different virtual aids for assisting motor-impaired users when pointing at and clicking on links. One of them, the “circular cursor”, aims at reducing the level of accuracy required for clicking on links, whereas the other one, the “cross cursor”, aims at reducing target distance for pointing at them. We conducted a web-based usability testing for both cursors with 9 motor-impaired and 6 able-bodied users applying their usual pointing device (4 keyboard, 4 joystick, 1 trackball and 6 mouse). The results show that motor-impaired participants mainly preferred one of either of the two variants proposed to the traditional cursor without any virtual aid for Web browsing.

Notes:

Montreal, Canada 2016
An Empirical Investigation of the Situationally-Induced Impairments Experienced by Blind Mobile Device Users

Ali Abdolrahmani, Ravi Kuber, Amy Hurst
UMBC

In this paper, we describe a study specifically focusing on the situationally-induced impairments and disabilities (SIIDs) which individuals who are blind encounter when interacting with mobile devices. We conducted semi-structured interviews with eight legally-blind participants, and presented them with three scenarios to inspire discussion relating to SIIDs. Nine main themes emerged from analysis of the participant interviews, including the challenges faced when using a mobile device one-handed while using a cane to detect obstacles along the intended path, the impact of using a mobile device under inhospitable conditions, and concerns associated with using a mobile device in environments where privacy and safety may be compromised (e.g. when using public transport). These were found to reduce the quality of the subjective interaction experience, and in some cases limiting use of mobile technologies in public venues. Insights from our research can be used to guide the design of future mobile interfaces to better meet the needs of users whose needs are often excluded from the design process.

Notes:
AudioDraw: User Preferences in Non-visual Diagram Drawing for Touchscreens

William Grussenmeyer; Eelke Folmer
University of Nevada, Reno

It can be very difficult and sometimes impossible for people who are blind to create visual diagrams on their own. Even with sighted assistance, it can be difficult to verbally convey the visual image in one’s mind. We conducted a survey to determine the need of people who are blind to create their own diagrams. Based on this survey, we created a preliminary design probe app on a tablet and revised the prototype through preliminary user feedback. Then, using this second app, we conducted a design probe study with 8 participants who are visually impaired and interviewed them about the potential of using touchscreens to create diagrams. Our results show that most participants were enthusiastic about the possibility of creating their own diagrams via a touchscreen and felt that this also makes touchscreens more accessible to them, creating more inclusion for them in the use of touchscreens.

Notes:
The Effects of Automatic Speech Recognition Quality on Human Transcription Latency

Yashesh Gaur, Carnegie Mellon University; Walter Lasecki, University of Michigan; Jeffrey Bigham, Carnegie Mellon University; Florian Metze, Carnegie Mellon University

Transcription makes speech accessible to deaf and hard of hearing people. This conversion of speech to text is still done manually by humans, despite high cost, because the quality of automated speech recognition (ASR) is still too low in real-world settings. Manual conversion can require more than 5 times the original audio time, which also introduces significant latency. Giving transcriptionists ASR output as a starting point seems like a reasonable approach to making humans more efficient and thereby reducing this cost, but the effectiveness of this approach is clearly related to the quality of the speech recognition output. At high error rates, fixing inaccurate speech recognition output may take longer than producing the transcription from scratch, and transcriptionists may not realize when transcription output is too inaccurate to be useful. In this paper, we empirically explore how the latency of transcriptions created by participants recruited on Amazon Mechanical Turk vary based on the accuracy of speech recognition output. We present results from 2 studies which indicate that starting with the ASR output is worse unless it is sufficiently accurate (Word Error Rate of under 30%).

Notes:
Computer Vision-based Analysis of Web Page Structure for Assistive Interfaces

Michael Cormier, University of Waterloo

My PhD research aims to develop novel solutions to the challenge of identifying web page structure through the visual analysis of web pages as images. The intention is to then combine this back end design with various front end applications in order to provide improved web experiences for users with assistive needs (e.g. assisting visually impaired users by supporting more selective screenreader output, or improving experiences of users with cognitive deficits by allowing reduction of clutter or zooming in on selected web page content). I propose to build a comprehensive computer vision-based system to analyse the semantic structure of web pages based purely on an image of the rendered page, which will produce a rich representation of the page as a tree of regions labelled according to their semantic role. Most research into web page segmentation has focused on the use of the structure of the DOM tree and visual features derived from properties specified in the DOM tree. I argue, however, that the image of the rendered page may be a better representation to use, since it is created by the page designer to convey the structure of the page to the user, while the source code and DOM tree are simply intended to cause the browser’s rendering engine to produce the correct appearance, and treat many types of content as black boxes. Additionally, my proposed system uses exactly the information seen by a user regardless of implementation method; this gives advantages in implementation-independence and versatility.

Notes:
DysMusic: Detecting Dyslexia by Web-based Games with Music Elements

Maria Rauschenberger, Universitat Pompeu Fabra

The aim of this research is to show that a playful approach combined with music can detect children with dyslexia. Early detection will prevent children from suffering in school until they are detected due to bad grades. Our envisioned web application will contribute to 10% of the population by giving them a chance to succeed in life and find their skills to impress the world.

Notes:
Evaluating the Mobile Web Accessibility of electronic text for people with print impairments in Higher Education

Neil Rogers, University of Southampton

The aim of this extended abstract is to demonstrate a framework that provides a novel solution for evaluating the mobile web accessibility of electronic text for people with print impairments in Higher Education (HE). The current framework explores over 500 device settings. Furthermore, the scope of this research is outlined alongside two research questions. The paper then concludes by suggesting the potential impact this research could have on existing standards, the public availability of metadata and guidelines, and the automatic generation of personalized eTexts as per user needs

Notes:
Accessibility Barriers to Online Education for Young Adults with Intellectual Disabilities

Erin Buehler, William Easley, Amy Poole, Amy Hurst
University of Maryland, Baltimore County

In postsecondary education, technology and online resources have become a pervasive component of learning, but they are not always accessible. For students with intellectual disabilities, completing technology-dependent tasks may pose unique challenges that are not always addressed by the disability support services offered at the university level. During our fieldwork, we have observed several barriers to online education tools in a postsecondary environment for students with intellectual disabilities. For example, a student with an intellectual disability submitting an assignment via email to an instructor may encounter difficulties recalling and navigating to the location of their attachment file.

In this paper, we describe core skills and common interfaces that we have identified as problematic for this population through an emic ethnography. We offer emic (perceptions from within a given environment) experience accounts to highlight the obstacles we have observed in a) information retrieval, b) navigation and information architecture c) file management, and d) password management. As researchers and educators involved in a postsecondary program for young adults with intellectual disability (ID), we have spent considerable time working with this population. For each scenario, we offer examples from our own experience of the techniques and technologies that did or did not help students accomplish these tasks. Based on these experiences, we provide recommendations for mitigating these barriers including education and training for students and developers and the use of existing interventions and tools. We also discuss future directions for this work. We believe that heightened awareness and communication between educators, designers, and students with disabilities will help address these problems and generate solutions which provide more accessible education experiences for learners with diverse needs.

Notes:
An Online Chess Game Designed for People with Dyslexia

Luz Rello, Carnegie Mellon University; Sergi Subirats, Universitat Pompeu Fabra; Jeffrey P. Bigham, Carnegie Mellon University

Teaching chess to students with learning disabilities has been shown to benefit their school performance in unrelated domains. At the same time, chess involves skills that are highly correlated with dyslexia, such as visuospatial and calculation abilities. In this paper, we created an online chess game designed for people with dyslexia and seek to understand whether people with dyslexia learn and play chess online in ways that differ from other students and whether such differences may be leveraged to improve classroom performance. To test how people with dyslexia learn to play chess, we carried out a within-subject experiment with 62 participants, 31 of them with diagnosed dyslexia. Participants used an instrumented web-based chess learning platform that we developed to (i) complete lessons on how to play chess and about chess theory, (ii) work through exercises designed to test and reaffirm their skills, and (iii) play chess against a computer opponent. We could not find significant differences on four dependent measures out of the twelve measures we collected. Therefore, dyslexia might have an impact on how people learn and play chess using a computer, suggesting that chess may be useful as a fun way to help people with dyslexia improve their abilities.

Notes:
Towards a Multilingual Dyslexia Detection using Online Games

Luz Rello, Carnegie Mellon University; Kristin Williams, Carnegie Mellon University; Abdullah Ali, University of Maryland Baltimore County; Nancy Cushen White, University of California San Francisco; Jeffrey P. Bigham, Carnegie Mellon University

At least 10% of the global population has dyslexia. In the United States and Spain, dyslexia is associated with a large percentage of school drop out. Current methods to detect risk of dyslexia are language specific, expensive, or do not scale well because they require a professional or extensive equipment. A central challenge to detecting dyslexia is handling its differing manifestations across languages. To address this, we designed a browser-based game, Dytective, to detect risk of dyslexia across the English and Spanish languages. Dytective consists of linguistic tasks informed by common errors made by persons with dyslexia. To evaluate Dytective, we conducted a user study with 60 English and Spanish speaking children between 7-12 years old. We found children with and without dyslexia differed significantly in their performance on the game. Our results suggest that Dytective is able to differentiate school age children with and without dyslexia in both English and Spanish speakers.

Notes:
Learning Games for Cognitive Impaired People

Maria Claudia Buzzi, Marina Buzzi, Erico Perrone, Beatrice Rapisarda, Caterina Senette
CNR-IIT

Learning environments have been profoundly reshaped by pervasive technology. New educational methodologies take full advantage of ICT in a mobile customized user-friendly environment, to support learning and stimulate individuals’ potential. Unfortunately, technology-enhanced learning tools are not often designed with accessibility in mind, although they can greatly benefit the personal empowerment and inclusion of special-needs people. To address this gap, a Web platform has been created for delivering accessible games to people with Down syndrome. Since personalization, orderliness and positive reinforcement are crucial to learning in these subjects, the platform offers a personalized safe environment for learning, conforming to behavioral analysis principles. Learning analytics are incorporated in the platform for easy monitoring of student progress via Web interfaces. The participatory design driving the development of the learning platform allowed the customization of the games’ discriminative stimuli, difficulty levels and reinforcement, as well as the creation of a game “engine” to easily set up new personalized exercises. These customization features make the game platform usable by a larger audience, including individuals with learning difficulties and autism.

Notes:
Masterplanning the Digital Campus to Support Learners with Disabilities

David Sloan, Sarah Horton, Billy Gregory
The Paciello Group

Organizations that deliver online learning must be strategic and holistic in their accessibility approach, ensuring all necessary structures are in place to support accessible and equitable experiences for learners with disabilities. Responsibility for accessibility must be distributed appropriately across all stakeholder groups. By adopting stewardship activities common in physical campuses, a more strategic approach can be applied to the digital campus. Masterplanning the digital campus means addressing near-term activities with a long view—one that takes into account the underlying infrastructure as well as the surface-level structures where people engage more directly in the learning process. This paper presents foundational activities around policy, process, programs, and practice that are necessary to support the creation of a sustainable, accessible online learning environment.

Notes:
Measuring the Impact of Automated Evaluation Tools on Alternative Text Quality: a Web Translation Study

Silvia Rodríguez Vázquez, University of Geneva

The number of Internet users has increased tenfold since the beginning of the century up to present, especially thanks to the improvements experienced in web accessibility and the growing number of languages which online content is available in. While translation professionals are making a considerable contribution to that digital information richness, little evidence exists regarding their involvement in the achievement of a more accessible web for all. In this paper, we present the main results of the first empirical study on web accessibility conceived around a translation task. The experiment sought to particularly investigate the quality of image text alternatives produced by French translators with the help of two evaluation tools: aDesigner and Acrolinx. The assessment of their alt text proposals, carried out by seven screen reader users, suggests that using both tools helps translators to create more appropriate text alternatives than when trying to do so with only one tool or without any automated support. A more in-depth analysis of the data gathered shows that Acrolinx offers better guidance than aDesigner for translators to render images accessible.

Notes:
A Platform to Support Personalized Training for People with Disabilities

Carlos Cardonha, Andrea Britto Mattos, Rodrigo Laiola Guimares
IBM Research

Digital education has potential to provide different possibilities for personalization and consequently reach a larger and more diverse number of people. Personalization is a key component of solutions addressing important and long-standing pedagogical challenges in education, such as dealing with heterogeneity of learning styles. In particular scenarios where accessibility support is required, personalization depends on the creation of different representations for individual pieces of content. In this light, the main goal of this article is to describe how we addressed the challenges involved in the construction of a platform that satisfies this requirement. Wethus present a system that supports the creation, adaptation, and delivery of personalized courses for people with multiple types of disabilities. More specifically, we introduce the technology, describe its main capabilities, and discuss the results of early evaluations by two instructors of an institution that provides vocational training for people with intellectual disabilities. Our initial results show that the tool was favorably assessed by the instructors and can potentially be adopted in this community.

Notes:
Wearables for All: Development of Guidelines to Stimulate Accessible Wearable Technology Design

Jobke Wentzel, University of Twente; Eric Velleman, The Accessibility Foundation; Thea van der Geest, University of Twente

In this paper, we present the rationale and approach for establishing guidelines for the development of accessible wearables. Wearable technology is increasingly integrated in our everyday lives. Therefore, ensuring accessibility is pivotal to prevent a digital divide between persons who have and persons who lack access to these devices, caused by their abilities. We present a project in which guidelines are created that enable developers to design accessible wearable apps and technologies. These guidelines will be created with developers who have experience with designing accessible technology and/or wearables. In addition, users who (potentially) experience problems with accessibility of wearables (persons who have a disability) are involved in the development of the guideline, to ensure their validity from an end-user perspective.

Notes:
Widening access to online health education for lung cancer: A feasibility study

Julia Mueller, Alan Davies, Simon Harper; Caroline Jay, Chris Todd
University of Manchester

Having lung cancer is associated with accessibility issues because people afflicted with lung cancer tend to be older and less familiar with technology, and have low education levels and low health literacy. Fear, embarrassment and stigmatization also play a role. This makes it difficult for people to access the information they need to understand and manage their illness, particularly in the time before the diagnosis. We can mitigate these disadvantages and bridge the accessibility gap by ensuring people at risk for lung cancer are informed about symptoms and when to seek medical advice. The Web is uniquely placed to fulfill this role. We therefore developed an online lung cancer symptom appraisal tool tailored towards people with low education levels and health literacy and based on psychological theory to target barriers like fear and embarrassment. At present we are conducting a feasibility study to assess whether it is possible to reach the high risk population and encourage early help-seeking. So far, 97 users have participated, 97.9% of which report symptoms and risk factors that indicate they should seek medical help. 34% report education levels below school leaving qualification. Our tool led to a significantly higher intention to seek medical help than the same information without theory-based components (p = 0.01). Our initial analyses suggest this is a suitable approach to widening health education to excluded groups.

Notes:
Using Web Interaction to Monitor Parkinson's Disease Progression through Behavioural Inferences on the Web

Julio Vega, University of Manchester

Traditional Parkinson's Disease (PD) assessment techniques are inaccurate, sporadic and subjective. Although recent works have used wearable devices to try to overcome these issues, most interfere with people’s routines, are uncomfortable to use and unsuitable for long-term assessments. In contrast, my approach aims to monitor PD in a longitudinal, naturalistic, non-disruptive and non-intrusive way. It uses smartphones to log social, environmental and web interaction data about people and their surroundings. This data is complemented with other web data sources and then processed to infer a set of metrics (a latent behavioural variable or LBV) of people’s activities and habits. Then, LBVs’ trends are quantified and mapped to the progression of the disease. During a first pilot study, I collected a dataset with ≈290 million records that has 34.5x more rows and scanned 4x more data sources than state-of-the-art sets. I used this data to identify six possible PD-related LBVs. This project aims to get a more accurate disease picture and to reduce the physical and psychological burden of traditional and other technology-based assessment methods. Ultimately, the work has the potential to save people’s time and improve the efficiency and effectiveness of health services.

Notes:
Developing a Wearable Tactile Prototype to Support Situational Awareness

Flynn Wolf, University of Maryland

Research towards my dissertation has involved a series of perceptual and accessibility-focused studies concerned with the use of tactile cues for spatial and situational awareness, displayed through head-mounted wearables. These studies were informed by an initial participatory design study of mobile technology multitasking and tactile interaction habits. This research has yielded a number of actionable conclusions regarding the development of tactile interfaces for the head, and endeavors to provide greater insight into the design of advanced tactile alerting for contextual and spatial understanding in assistive applications (e.g. for individuals who are blind or those encountering situational impairments), as well as guidance for developers regarding assessment of interaction between under-utilized sensory modalities and underlying perceptual and cognitive processes.

Notes:
Using Data from Social Media Websites to Inspire the Design of Assistive Technology

Xing Yu, University of Indiana

The rapid accumulation of user generated content on the Internet provides researchers with abundant information to extract knowledge from. It also provides HCI and accessibility practitioners with a new direction to explore and understand users requirements beyond traditional approaches. In my work, I create a tool that consists of both text-mining and machining learning methods to extract essential focuses of design out of the data collected from social networks. This tool can be used at the initial stage of a product design lifecycle by designers to collect key design aspects at a fairly low cost.

Notes:
Session 10: Accessible Multimedia

Supporting Engagement and Comprehension Online Through Multiple Means of Expression

Boris Goldowsky, Peggy Coyne
CAST

In online learning settings text remains the primary, sometimes only medium in which discussion takes place. However, recent advances in web standards and technologies now enable images and user-recorded audio to be seamlessly integrated into online tools, and research in multimedia composition suggests that allowing multiple media in discussions may lead to higher student engagement and more varied expression. This paper examines the use of, and reactions to, a discussion area that includes the ability to audio record or draw as well as type, implemented within a classroom tool that uses the principles of Universal Design for Learning to engage and support struggling readers. We find wide variability in how the tools are perceived and used, but promising results from a range of students in inclusive, remedial, and substantially separate classrooms.

Notes:
Supporting the Selection of Web Content Modality Based on User Interaction Logs

Fabiano Marcon de Moraes, IBM Research; Vagner Figueredo de Santana, IBM Research; Juliana Cristina Braga, UFABC

Internet offers a huge amount of services related to government, entertainment, and communication. However, to ensure that any citizen can have proper access to all services and information, it is necessary to think about accessibility in a broader way than it is found in the Web. Universal Design points to a way of thinking about the heterogeneity of capabilities instead of segregating according to individual disabilities. In the Web, applying this approach involves solving the challenge of selecting the appropriate content modality, at the appropriate time. Thus, this work present a study focusing on selecting the modality of a Web content based on the data resulting from a single pageview, minimizing efforts related to profile filling or explicit customization of Web systems. The study involved the analysis of 261 sessions, 31 coming from people that informed being using assistive technology. From the experiment performed it was possible to identify that the algorithm Random Committee provided the best results for the studied problem (precision 94.8%; recall of 94.3%). Results are potentially of interest for Human-Computer Interaction practitioners aiming at providing adequate content modality after minimum usage.

Notes:
LMS weds WhatsApp

Saurabh Srivastava, Jyotirmaya Mahapatra, Kuldeep Yadav, Kundan Shrivastava, OM Deshmuk
Xerox Research Centre India

Recently, Mobile Instant Messaging Services (MIMs) such as WhatsApp have shown tremendous potential in enabling communication among diverse set of people. Such services have an even more critical role to play in developing regions. Due to the digital divide, a much higher prevalence of mobile-only internet connection has been reported, where millions of users leapfrogged to mobile-internet entirely skipping the desktop-based internet phase. In this paper, we report findings from a longitudinal field study conducted in a private higher education institution in India. The aim of the study was to explore the potential of an integrated blended learning setup which combines WhatsApp with a Learning Management System (LMS). The study was performed in a class of 20 final year engineering students over a period of three months. Our findings suggest that there is a systematic bias in the usage of WhatsApp vs. LMS based on several factors, including specifics of the learning activity, student behavior, and status of the course in the semester, and the time of the day. Synchronous and asynchronous interaction on WhatsApp are perceived to be engaging, support collaboration and aid learning by complementing LMS-based and face-to-face learning.

Notes:
Laying a Foundation for the Graphical Course Map

Linda P. DuHadway, Thomas C. Henderson
School of Computing, University of Utah

The learning managements systems (LMS)s that are widely used to provide access to educational opportunities on the Web are limited by a text based, linear presentation of course materials and the standard temporal restrictions in the traditional classroom. Making a fundamental change in how course materials are presented and interfaced with can make educational opportunities available to a broader spectrum of people with diverse abilities and various circumstances. We have developed a graph-based approach to presenting the learning materials of a course using a system called ENABLE [6, 7] with three major goals: (1) facilitate restructuring a set of synchronous classroom materials into a dynamic online system, (2) provide algorithms to analyze and enhance student performance as well as provide insights to the instructor concerning the efficacy of the learning items and their organization, and (3) identify ways to use data from an existing linear, temporal based course presentation to train predictive models for a course that allows individual flexibility in the ordering of the material. This work demonstrates the possibility of presenting course materials in a graphical way that expresses important relations and provides support for manipulating the order and timing of those materials. The graphical course map adds a new approach to making education accessible to people from many different spectrums of ability that respond and interface better with visual representations and those who will benefit from the removal of temporal limitations.

Notes:

Montreal, Canada 2016
HTML5 Accessible Video Player

Crista Earl, American Foundation for the Blind; Elizabeth Neal, American Foundation for the Blind

In this paper, we describe the development of an HTML5 video player, created for implementation by web developers. This player removes a barrier to media for people with disabilities. The reasoning behind the applied design features is outlined.

Notes:
On Digital Accessibility: Where do we need to go from here?

Jennison Asuncion, Co-Founder, Global Accessibility Awareness Day

We have certainly come a long way since the publication of the Web Content Accessibility Guidelines (WCAG) V2.0 in 2008. Between advances such as the Accessible Rich Internet Applications specification (WAI-ARIA), work done to make frameworks like Drupal and Angular JS more accessible, and legislation such as the 21st Century Communications and Video Accessibility Act (CVAA) in the USA and the internet regulations under the AODA in Canada, we have seen progress in digital accessibility. Or have we? The reality is that while we have definitely seen pockets of progress on various fronts, many websites, mobile applications, and technologies that we have yet to see (but are being thought-up by startups around the world) have and are not considering accessibility.

It is within this context that based on his experience and observations, having worked in the digital accessibility space for over ten years, Jennison Asuncion will discuss what he sees as some of the areas where we who live and breathe digital accessibility need to step in, and in some cases, step up, if we are going to see the kind of sustained improvements in digital accessibility that are scalable and that will keep pace with the rapid pace of technology change.

About the William Loughborough Speech. This has been an annual and eagerly-anticipated part of W4A since 2010, when it was introduced in memory of William Loughborough, a long-time advocate for accessibility and inclusive design. William was a talented technologist and engineer, and an enthusiastic supporter of W4A, regularly providing thoughtful feedback to presenters in his inimitable way. We invited William to speak at the W4A 2010 conference dinner in Raleigh, North Carolina; but sadly he died shortly before the event. So, in William’s honour, every year we invite a well-regarded speaker from the accessibility community to address the conference delegates with a speech that is likely to be provocative, challenging conventions, insightful and humorous—and always one that will give us food for thought.

Find out more about William’s life and work at:
http://media-dis-n-dat.blogspot.co.uk/2010/05/obituary-william-loughborough-pioneer.html
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