Multi-Cultural Human-Drone Interaction Workshop

Jessica R. Cauchard
Ben Gurion University of the Negev
Be'er Sheva, Israel
jcauchard@acm.org

Anna Wojciechowska
IT University Copenhagen
Copenhagen, Denmark
wojciechowska.anna2511@gmail.com

Andrés Lucero
Aalto University
Espoo, Finland
lucero@acm.org

ABSTRACT

This hands-on workshop brings together researchers and practitioners to discuss the cultural aspects of Human-Drone Interaction design. An increasing body of work [2–4, 8] shows that the one-fits-all model of interaction might be obsolete, especially when considering natural interactions where people use gesture and voice that are culturally dependent [7]. In the first part of the workshop, each attendee will present their accepted position paper on the topic. As a group, we will discuss ideas around social drone designs and leverage everyone's expertise to discuss cultural aspects when designing effective and enjoyable interactions. We encourage the exchange of research results and ideas for future research attempts. The second part of the workshop will be a hands-on activity involving a participatory design task for human-drone interaction. The workshop goal is to develop a road-map for cross cultural interactions with drones.

CCS CONCEPTS

• **Human-centered computing → HCI design and evaluation methods**; **Interaction design process and methods**; Collaborative and social computing design and evaluation methods; • **Computer systems organization** → *Robotics*.

KEYWORDS

Multi-cultural, human-drone interaction, social robotics, uav, drone, participatory design, prototyping

1 BACKGROUND

An increasing body of research in Human-Computer and Human-Robot Interaction highlights cross-cultural differences in terms of how people behave with technology [4, 8]. For instance, some of our prior work shows that there are significant differences in how people naturally interact with a flying robot [1, 2]. While most of

the world's technology is being developed in the US and China "Silicon Valleys", it becomes primordial to think about how people actually want to interact with technologies and whether cultural models need to be taken into consideration.

In this workshop we propose to discuss topics around the multi-cultural aspects of human-robot interaction, focusing on the example of a social robot. PDC2020 in Colombia is an exceptional venue for this workshop as it is a truly multi-cultural conference with local researchers and attendees from Latin America that are sadly often under-represented in SIGCHI conferences. We believe that running this workshop in Manizales will be an incredible opportunity to think outside the box in terms of interaction and future applications. This hands-on workshop will bring together human-computer interaction researchers and practitioners to exchange ideas and discuss results and methodologies about the future of cross-cultural human-robot interactions. The workshop's objectives are as follow:

(1) Bring together a community of researchers interested in cross-cultural design and interaction
(2) Have researchers present their ideas and receive feedback on their work
(3) Develop novel concepts and methodologies for multi-cultural HRI using a participatory design activity.
(4) Establish a road-map for cross-cultural technology design and explore future collaborations.

The workshop's results will be submitted to a top-tier conference and attendees will be invited to collaborate on the research paper.

2 ORGANIZERS

Dr. Jessica Cauchard is an assistant professor in the department of Industrial Engineering and Management at Ben Gurion University of the Negev in Israel. Her research focuses on the design, development, and evaluation of interaction techniques for novel devices such as wearables and drones. She was awarded a PhD at the University of Bristol in 2014. Jessica ran several workshops in HCI and Design at academic conferences such as ACM CHI 2019, AfriCHI 2018, and at the Grace Hopper conference. She has also served on several conference organizing committees such as being demonstration chair for CHI 2018.

Ms. Anna Wojciechowska is a Masters student at the IT University of Copenhagen and former research assistant at Ben Gurion University of the Negev in Dr. Cauchard's lab. Anna's research focuses on Human-Drone Interaction and in particular how people can interact with these new technologies when they are collocated. One of her recent project investigated how a drone can approach a person in a non-threatening manner to initiate interaction. She is currently concentrating her efforts on understanding whether the robotics "Uncanny Valley" concept is applicable to flying robots

(a.k.a. drones) and how the look and feel of the drones affect people's perception and expectations.

Andrés Lucero is Associate Professor of Interaction Design and research leader of the Embodied Design Group (EDG) at Aalto University in Finland. His work focuses on the design and evaluation of novel interaction techniques for mobile devices and other interactive surfaces. He received his MA degree in Visual Communication Design from Universidad Tecnológica Metropolitana (1999), PDEng in User-System Interaction from Eindhoven University of Technology (2004), and PhD in Human-Computer Interaction from Eindhoven University of Technology (2009). He has recently co-organized workshops at CHI, MobileHCI, and DIS.

3 WEBSITE

A website will be created and will contain the following information regarding the workshop:

- Description including aims and objectives.
- Call for papers, important dates, and instructions to submit.
- Workshop Program.
- Organizers' biography.
- Position Papers.

4 PRE AND POST WORKSHOP PLANS

The section below describes our pre-workshop plans.

4.1 Upon Acceptance

- Create workshop submission email
- Finalize website
- Invite keynote speaker
- Advertise workshop via multiple media:
  (1) Mailing lists: CHI-ANNOUNCEMENTS@listserv.acm.org, PHD-DESIGN@jiscmail.ac.uk, BCS-HCI@jiscmail.ac.uk, and annonces@afihm.org.
  (2) Contacting local researchers: Universidad de Caldas and Universidad de los Andes.
  (3) Contacting authors and attendees of PDC2020.
  (4) Facebook groups: ACM SIGCHI, CHI Meta, and CHI Women.

4.2 After Submission Date

- Review submitted papers
- Send out notifications to author and instructions for camera ready
- Upload papers to the website

4.3 Before the Conference

- Confirm room and equipment needs with the workshop chairs
- Finalize workshop activity and program of the day

4.4 After the Conference

- Send email to all attendees with workshop notes
- Invite attendees to collaborate on research paper using the workshop activity's outcomes. Venues such as ACM CHI or ACM/IEEE HRI conferences will be considered.

Start	End	Activity
9.00am	9.30am	Introduction and goals of the workshop
9.30am	10.30am	Participants present their paper to the audience, including some time for Q&A
10.30am	11.00am	Break
11.00am	12.00pm	Focus Group
12.00pm	1.00pm	Lunch Break
1.00pm	2.00pm	Participatory Design group activity
2.00pm	2.30pm	The groups present their findings
2.30pm	3pm	Wrap up and take-away message

- Write up white paper and research road-map on multi-cultural human-robot interaction to be made available to all attendees and potentially disseminated through Communications of the ACM.

5 WORKSHOP STRUCTURE

This workshop is designed to allow for participants to discuss topics and work together on a design activity to bring creativity in the process. The day will start with the organizers introducing themselves, the workshop format and the aims of the day. It will then move to individual presentations from the attendees who submitted position papers. There will be around 10 minutes per presentation, and 2 minutes for questions and answers for each position paper. A workshop lunch will allow attendees to continue their conversations from the morning session. After lunch, we will facilitate a group activity around designing prototypes of a social Unmanned Aerial Vehicles (UAV). We will provide various types of displays, sensors, and materials to build prototypical applications. At the end of the activity, each group will be given time to present their findings. After the activity, we will start a discussion on findings and take away messages. The potential future research areas will be addressed with the aim of forming collaborations amongst participants. The proposed schedule is as follows:

6 PARTICIPATORY DESIGN ACTIVITY

In addition to the traditional workshop format where attendees present their work, we propose a hands-on activity based on dialogue-labs [5]. This participatory design activity leverages on participants' expertise, as HCI researchers and practitioners, as well as on their creativity and their own personal experience with technology. We aim to understand how people of diverse cultures and backgrounds come together to envision a cross-cultural social robot. Participants will be split into groups of 3 to 4 people. We will provide design materials with the intention of sketching and prototyping. Attendees will start with a short and fun warm-up game to get them into the open and creative mindset. This participatory design activity is built on prior research on designing a social robot [6]. We will give a series of instructions, each followed by short design sprints where attendees will solve the task alone or in team. They will be asked to brainstorm physical features, applications, interactions expected of a social robot, and future use cases. Collectively, they will determine which of the features are the most important ones, and help determine what a social robot is and what it looks like. Attendees will then be given evaluation tools to better understand their

designs and situate them culturally. Each team will then present their results and share their findings with the whole group. We will encourage attendees to continue the work started over the workshop afterwards.

7 AUDIENCE

The workshop is targeting researchers and practitioners from the Human-Computer Interaction research community. We also want to involve the local youth and invite several local students to participate to the workshop and the hands-on activity. PDC 2020 is a special venue to hold this workshop as it will more likely brings together researchers from the whole American continent, who are often under-represented in international SIGCHI conferences. We will focus on bringing together attendees from diverse backgrounds and would like to attract 5-7 strong position papers and a total of 15 attendees.

8 CALL FOR PARTICIPATION

We are pleased to invite you to participate to this one-day workshop on Multi-Cultural Human-Robot Interaction, held on June 15th as part of the Participatory Design conference in Manizales, Colombia. We invite you to participate in this workshop by submitting a position paper at the latest on May 1st. About the workshop: This hands-on workshop brings together researchers and practitioners to discuss the cultural aspects of Human-Robot Interaction (HRI) design. Recent work shows that the one fits all model of interaction might be obsolete, especially when considering natural interactions where people use gesture and voice, that are culturally dependent. In the first part of the workshop, each attendee will get a chance to present a position paper on the topic. We will discuss ideas around social robot designs and leverage everyone's expertise to discuss cultural aspects when designing effective and enjoyable interactions. We encourage the exchange of research results and ideas for future research attempts. The second part of the workshop will be a hands-on activity involving a participatory design task for a cross-cultural robot.

Call for participation: In order to be admitted to the workshop, the participant should write a 2-4 page position paper following the SIGCHI Extended Abstracts format (https://sigchi.org/templates/) and submit it before May 1st, 2020 to: cultural.drones@gmail.com. We embrace proposals from a large variety of subjects and domains. Examples of topics include but are not limited to:

- Cross-cultural differences and similarities in HRI
- Challenges and implications of HRI
- Design aspects of social robots
- Acceptability and social Norms
- Values, ethics, and policies
- Novel enabling technologies
- I/O techniques for HRI
- Future applications for social robots

More Information: https://culturaldrones.wixsite.com/pdc2020

Workshop organizers: Dr. Jessica Cauchard (Ben Gurion University of the Negev, Israel), Ms Anna Wojciechowska (IT University Copenhagen), Andrés Lucero (Aalto University).

REFERENCES

[1] Jessica R. Cauchard, Jane L. E, Kevin Y. Zhai, and James A. Landay. 2015. Drone & Me: An Exploration into Natural Human-drone Interaction. In *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (Osaka, Japan) *(UbiComp '15)*. ACM, New York, NY, USA, 361–365. https://doi.org/10.1145/2750858.2805823

[2] Jane L. E, Ilene L. E, James A Landay, and Jessica R Cauchard. 2017. Drone & Wo: Cultural Influences on Human-Drone Interaction Techniques. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)* (2017), 6794–6799. https://doi.org/10.1145/3025453.3025755

[3] Vanessa Evers, Heidy C. Maldonado, Talia L. Brodecki, and Pamela J. Hinds. 2008. Relational vs. Group Self-construal: Untangling the Role of National Culture in HRI. In *Proceedings of the 3rd ACM/IEEE International Conference on Human Robot Interaction* (Amsterdam, The Netherlands) *(HRI '08)*. ACM, New York, NY, USA, 255–262. https://doi.org/10.1145/1349822.1349856

[4] Frederic Kaplan. 2004. Who is Afraid of the Humanoid? Investigating Cultural Differences in the Acceptance of Robots. 1 (09 2004), 465–480.

[5] Andrés Lucero, Kirsikka Vaajakallio, and Peter Dalsgaard. 2012. The dialogue-labs method: process, space and materials as structuring elements to spark dialogue in co-design events. *CoDesign* 8, 1 (2012), 1–23. https://doi.org/10.1080/15710882.2011.609888

[6] Molly C. Martini, Rabia Murtza, and Eva Wiese. 2015. Minimal Physical Features Required for Social Robots. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 59, 1 (9 2015), 1438–1442. https://doi.org/10.1177/1541931215591312

[7] David Matsumoto and Hyisung C. Hwang. 2013. Cultural Similarities and Differences in Emblematic Gestures. *Journal of Nonverbal Behavior* 37, 1 (01 Mar 2013), 1–27. https://doi.org/10.1007/s10919-012-0143-8

[8] Lin Wang, Pei-Luen Patrick Rau, Vanessa Evers, Benjamin Krisper Robinson, and Pamela Hinds. 2010. When in Rome: The Role of Culture & Context in Adherence to Robot Recommendations. In *Proceedings of the 5th ACM/IEEE International Conference on Human-robot Interaction* (Osaka, Japan) *(HRI '10)*. IEEE Press, Piscataway, NJ, USA, 359–366. http://dl.acm.org/citation.cfm?id=1734454.1734578