Examining Gaps and Opportunities for Engaging with Contextual Integrity in Human-computer Interaction

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PRIVACY THEORIES

- Classifying Information Type by Sensitivity

- Awareness and Control of Information

- State-based Perspective

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Privacy Paradox

PRIVACY THEORIES

- Classifying Information Type by Sensitivity

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Privacy Paradox

- Norm-based Perspective

RESEARCH QUESTIONS

- **RQ1**: Within which technology contexts do HCI researchers apply CI?

- **RQ2:** How deeply do HCI researchers engage with CI?

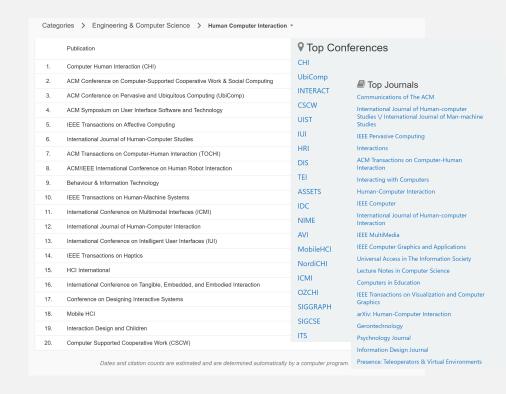- **RQ3:** What types of studies do HCI researchers conduct when applying CI?

METHOD: SEARCH CRITERIA

1. published within the last 10 years (2008-2017)

2. must be peer-reviewed, and

3. published in the top HCI journal or conference venues based on Google Scholar and Microsoft Academic Research rankings

   - union of rankings = 32 top HCI venues

METHOD: SEARCH AND ANALYSIS

KEYWORD SEARCH

- case-insensitive phrase "contextual integrity" in each of the 32 venues.

- A total of 24 papers were found.

  - 8 articles did not meet our search criteria

  - 1 duplicate article removed

- Final total = 15 articles

CODING DIMENSIONS

- **Technology context**: the type of technology being studied,

- **CI engagement**: to what extent CI was used in the research,

- **Type of HCI research conducted**: whether the study was a formative or summative evaluation and the type of scholarly contribution made by the research (e.g., design implications, framework, new technology).

Table 1: Article Counts by HCI Venue

Conference/Journal	Total Hits
ACM Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)	4
ACM Conference on Human Factors in Computing Systems (CHI)	3
Communications of The ACM Journal	3
ACM Conference on Pervasive and Ubiquitous Computing (UbiComp)	1
Human-Computer Interaction	1
Interacting with Computers Journal	1
International Journal of Human-Computer Interaction	1
Behaviour & Information Technology Journal	1
International Journal of Human-Computer Studies	1
ACM Symposium on User Interface Software and Technology (UIST), IEEE Transactions on Affective Computing Journal, ACM/IEEE International Conference on Human Robot Interaction (HRI), ACM Transactions on Computer-Human Interaction (TOCHI), ACM Conference on Designing Interactive Systems (DIS), ACM International Conference on Multimodal Interfaces (ICMI), International Conference on Human-Computer Interaction with Mobile Devices and Services (Mobile HCI), arXiv Human-Computer Interaction (cs.HC), ACM International Conference on Intelligent User Interfaces (IUI), IEEE International Symposium on Mixed and Augmented Reality (ISMAR), ACM Transactions on Interactive Intelligent Systems (TiiS), IEEE Transactions on Human-Machine Systems Journal, IEEE Transactions on Haptics Journal, ACM Eye Tracking Research & Application (ETRA), IEEE Pervasive Computing Journal, International Journal of Human-computer Studies $\vee$ International Journal of Man-machine Studies, ACM Interactions Magazine, IEEE Computer Magazine, IEEE Computer Graphics and Applications (CG&A), International Conference on Human-Computer Interaction (INTERACT), ACM International Conference on Tangible, Embedded and Embodied Interactions (TEI), International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS)	0
Grand Total	16

TECHNOLOGY CONTEXT IN WHICH CI IS USED

- **IoT (7/15)** e.g.,
  - Luger – new forms of consent
  - Jennings et al. – Human-Agent Collectives
- **Social Media (5/15)** e.g.,
  - Wang et al. – Facebook default privacy settings
  - Ayalon and Toch – temporal aspects of Facebook posts
  - Shi et al. – interpersonal privacy concerns on Facebook
- **Mobile Devices (3/15)** e.g.,
  - Shilton – data collection on mobile phones
  - Shklovski – potential privacy breaches
  - Moorthy and Vu – use smartphone voice activated personal assistants in public spaces

LEVEL OF ENGAGEMENT WITH CI

- **Referenced CI primarily in background literature (9/15)**
  - 2/9 – Citations Only
  - 7/9 – Explained the Framework
- **Guiding framework for understanding privacy challenges (2/15)**
- **Informed study design and data analysis (4/15)**
  - 2/4 – Informed codebook
  - 2/4 – Integrated into study design

THE TYPES OF HCI RESEARCH THAT APPLY CI (8/15)

- **Performed a user study (8/15)**
  - 7 Formative evaluations
  - 1 Summative evaluation
- **Design implications and avenues for future research (7/15)**

PRELIMINARY RECOMMENDATIONS

- Future studies could benefit from operationalizing the framework of CI as a robust multi-dimensional construct.

- Future studies focus on summative evaluations of systems that instantiate CI in a meaningful way

- Open-ended question

  - Systematic Scoping of the Literature (Forward reference search of Nissenbaum's Foundational Works = 79 additional articles)

  - Lens for qualitative coding (domain, depth and nature of engagement)

  - Distinguishing between CS and HCI

Privacy in Context: Critically Engaging with Theory to Guide Privacy Research and Design

Workshop @ CSCW (Jersey City, NJ) on Saturday Nov 3

- **Apply by September 24** (2-4 pg. position paper)

- **https://networkedprivacycscw2018.wordpress.com/**

- **Keynote: Helen Nissenbaum**

- **Organizers**: Karla Badillo-Urquiola (UCF), Yaxing Yao (Syracuse U.), Oshrat Ayalon (Tel-Aviv U.), Bart Knijnenburg (Clemson U.), Xinru Page (Bentley U.), Eran Toch (Tel-Aviv U.), Yang Wang (Syracuse U.), Pamela Wisniewski (UCF)

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QUESTIONS?

- Thank you!

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