

EPIC: Enhanced Privacy and Integrity Considerations for Research (Tutorial)

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ABSTRACT

This tutorial engages researchers in a series of collaborative activities towards Enhanced Privacy and Integrity Considerations (EPIC) for human subjects research in the artificial intelligence (AI) field. The tutorial aims to identify common challenges to study integrity, convey best practices for protecting participants at the point of study design, and discuss how to best design tools to support robust, privacy-enhancing human subjects research in AI. In particular, the tutorial provides hands-on training on how to determine sample size and collect participant demographics in a way that prioritizes data integrity, participant privacy, and sample representativeness. Tutorial participants discuss and troubleshoot the unique challenges to and opportunities for designing robust and ethical human-centered AI research.

CCS CONCEPTS

• **Human-centered computing** → **User studies**; • **Security and privacy** → *Privacy protections*.

KEYWORDS

participant recruitment, privacy, research integrity, human-centered AI

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1 MOTIVATION AND RELEVANCE

Human-centered design and evaluation approaches are essential to creating effective and ethical artificial intelligence (AI) systems [27]. The AI research field's increasing focus on human-centered evaluations (e.g., controlled experiments with real human users) requires researchers to make difficult decisions regarding the *type* and *extent* of data that they will collect about study participants. Demographic data collection is necessary to ensure the representativeness of a study sample and to achieve fairness of resulting insights and systems; however, such data can easily put study participants at risk of re-identification—especially when combined with behavioral data collected to power the AI system itself [25]. Similarly, decisions about the number of participants to recruit must be made carefully to meet the study's needs for statistical power, methodological robustness, or generalizability, while also avoiding unnecessary data collection.

The EPIC tutorial gives HCI and AI researchers fundamental knowledge on designing robust, privacy-preserving human subjects studies. The interactive tutorial engages individuals with varying expertise and experiences, inviting diverse perspectives to identify privacy and integrity concerns for human-centered AI (HCAI) studies and discuss paths forward for robust and ethical human subjects studies in AI. Participants simultaneously gain and contribute to knowledge on research best practices for protecting research participants and improving study design for AI studies.

2 FORMAT, ACTIVITIES, AND OBJECTIVES

The full-day EPIC tutorial engages participants through guided discussions, interactive lectures, hands-on lessons, and group activities. The morning sessions cover topics pertaining to existing practices, challenges, and opportunities for human subjects research in HCAI. After reviewing novel data on the sample size and demographic data collection practices at IUI, attendees participate in an affinity diagramming exercise to map the challenges and opportunities

HCAI researchers face regarding enhancing the privacy and integrity of research on AI systems. Next, subject matter experts present best practices for determining sufficient sample size for a study and designing privacy-preserving data collection tools in order to mitigate risks to participant privacy at the point of study design. Attendees then receive interactive, hands-on training to apply these best practices to their own planned studies. In the afternoon, attendees work together to apply their new knowledge to tackle the challenges to participant privacy and research integrity they identified earlier in the day in a participatory design session to inform solutions to support AI researchers in conducting robust, ethical HCAI research.

The tutorial's objective is to instruct and explore the process of determining key aspects of study design (i.e., sample size and demographic data collection), aiming for a balance between data utility and privacy considerations. The planned outcomes include:

- Attendees develop the ability to identify and navigate trade-offs between data collection practices and privacy expectations. Participants gain an advanced understanding of the tensions arising from the interplay of sample size, privacy concerns, and representation.
- Attendees understand best practices for determining sample size and demographic data collection and become familiar with resources they can use to implement these practices in their research.
- Attendees' discussion generates valuable insights to the HCAI community on enhancing the privacy and integrity of human subjects research. These insights are captured through focus groups, affinity diagramming, and participatory design sessions, and summaries of the takeaways are made available on the tutorial webpage.

3 TUTORIAL MATERIALS

Tutorial materials such as lecture slides and summaries of group insights generated through the activities will be available to the audience and general public on the tutorial webpage (<http://hatlab.org/epic/>).

4 TUTORIAL ORGANIZERS

The tutorial organizers are an interdisciplinary group of faculty and student researchers currently researching how to secure research workflows by developing usable tools for designing methodologically robust, data-minimizing human subjects data collection processes for AI research. This team brings a wide range of experience and expertise in research methods, usable privacy and security, and human-centered AI.

Kelly Caine is an expert on research methods, usable privacy and security (e.g., [18], [22]), human factors, human-computer interaction, AI [12], and engineering psychology. Dr. Caine co-authored the book *Understanding Your Users* [1], a comprehensive text on conducting studies with human participants, and her paper investigating sample sizes of human subjects studies published at CHI [4] guides researchers on choosing appropriate sample sizes. **Bart Knijnenburg** is a central figure in the human-centered AI research community. He is an expert in scale development and statistical evaluation [17] and has taught extensively on these topics at human-centered AI conferences and summer schools (e.g., [10]). He is also

an expert in usable privacy [6, 13] and user-tailored solutions to online privacy issues and privacy measurement [5, 7, 8, 11, 14–16, 19–21, 32]. **Emily Sidnam-Mauch** is an expert in computer-mediated communication and social media [30, 31, 34], quantitative methods, and survey research [28, 29, 33]. She has developed curricula on determining target sample size and composition, including calculating, interpreting, and reporting power analysis and effect size. **Susan E. McGregor** brings expertise in data science [24] and substantial research and applied experience in the design and implementation of privacy-preserving data applications [2, 3, 9, 26] and publishing approaches [23] for users outside of the privacy and security fields. **Hanna Alzughbi, Mehtab Iqbal, and Hansen Lee** are Ph.D. students in Human-Centered Computing at Clemson University, studying usable privacy and security, the design of transparent AI tools, and human-AI interaction, respectively.

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