

# CSE 510: Advanced Topics in HCI

Contributions in HCI

James Fogarty  
Daniel Epstein

Tuesday/Thursday  
10:30 to 12:00  
CSE 403



# Today

## Contributions in HCI

## Project Discussions

# Abstract (from original version)

Research in human-computer interaction addresses both technological and human-behavioral concerns. It follows that the contributions made in HCI are usually separately familiar to engineering, design, or the social sciences, but rarely brought together under one roof. ... The goal of this paper is to give researchers insight into the contribution types found in HCI papers, and to provide examples for further reading. I do not claim that the chosen examples are the “best of breed;” rather, they are examples with which I am familiar and that I feel illustrate a given contribution.

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Research in human-computer interaction addresses both technological and human-behavioral concerns. It follows that the contributions made in HCI are usually separately familiar to engineering, design, or the social sciences, but rarely brought together under one roof. ... The goal of this paper is to give researchers insight into the contribution types found in HCI papers, and to provide examples for further reading. I do not claim that the chosen examples are the “best of breed;” rather, they are examples with which I am familiar and that I feel illustrate a given contribution.

# Categories Chosen to Read

1. Empirical :
2. Artifact :
3. Methodological :
4. Theoretical :
5. Benchmark / Dataset :
6. Survey :
7. Opinion :

# 1. Empirical Contributions

Empirical research contributions are the backbone of science. They provide new knowledge through findings based on observation and data-gathering. Data may be qualitative or quantitative, aspiringly objective or unapologetically subjective, from the laboratory or from the field. In HCI, empirical contributions arise from a variety of sources, including experiments, user tests, field observations, interviews, surveys, focus groups, diaries, ethnographies, sensing, log files, and many others.

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# 1. Empirical Contributions

Empirical research contributions are evaluated mainly on the importance of their findings and on the soundness of their methods. If empirical findings are uninteresting or unimportant, or if the methods by which those findings arose are sloppy, imprecise, or confounded, then empirical contributions are judged unfavorably.



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## 2. Artifact Contributions

HCI is driven by the creation and realization of interactive artifacts. Whereas empirical contributions arise from descriptive discovery-driven activities (science), artifact contributions arise from generative design-driven activities (invention). Artifacts, often prototypes, include new systems, architectures, tools, toolkits, techniques, sketches, mockups, or envisionments that reveal new possibilities, enable new explorations, facilitate new insights, or compel us to consider new possible futures. New knowledge is embedded and manifested in artifacts and the supporting materials that describe them.

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## 2. Artifact Contributions

Artifact research contributions are evaluated according to the type of artifact that gave rise to them. They are often accompanied by empirical studies but do not have to be, and sometimes should not be [1]. New systems, architectures, tools, and toolkits are evaluated in a holistic fashion according to what they make possible and how they do so [3]. New input and interaction techniques, by contrast, are evaluated precisely and quantitatively so as to isolate their human performance benefits. New design expressions, including sketches, mockups, and envisionments, are evaluated by how insightful, compelling, and richly-painted is their expression. Of particular importance is how well designs embody tradeoffs and hold competing priorities in balance.

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# 3. Methodological Contributions

Methodological research contributions create new knowledge that informs how we carry out our work. Such contributions may improve research or practice. They may influence how we do science or how we do design. They may improve how we discover things, measure things, analyze things, create things, or build things.

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# 4. Theoretical Contributions

Theoretical research contributions consist of new or improved concepts, definitions, models, principles, or frameworks. They are vehicles for thought. Whereas methodological contributions inform how we do things, theoretical contributions inform what we do, why we do it, and what we expect from it. Theories may be qualitative or quantitative. They may have both descriptive and predictive power—by distilling the essential features of a phenomenon, they are also able to suggest how that phenomenon will behave. Fully developed theories offer explanatory accounts, not simply observing that but explaining why. Theories should be testable and falsifiable; if they are not, they do not qualify as scientific theories [5].

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Theoretical research contributions are evaluated based on their novelty, soundness, and power to describe, predict, and explain. A theory that accounts well for observed data from a specific situation but has no ability to generalize to new situations is of limited use. Conversely, a theory that is so broad it can account for anything probably does not contain any descriptive power. Theory validation is almost always achieved through empirical work.

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## 6. Survey Contributions

Survey research contributions review and synthesize work done on a research topic with the goal of exposing trends and gaps. Survey contributions are appropriate after a topic has reached a certain level of maturity. It is not uncommon for surveys to have references numbering in the hundreds. The journal ACM Computing Surveys is solely devoted to publishing survey contributions. In HCI, the journal Foundations and Trends in HCI regularly publishes survey contributions.

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Originally misses the role of meta-analyses in this definition. Also ACM-centric examples.

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# 7. Opinion Contributions

Opinion research contributions seek to change the minds of readers through persuasion. Although the term “opinion” might suggest a less-than-scientific effort, in fact, opinion contributions draw upon many of the above contribution types to make their case. Opinion contributions are considered a separate research contribution type not because they lack a research basis, but because their goal is to persuade, not just inform. Along with persuasion, the goal of opinion contributions is to compel reflection, discussion, and debate.



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# CHI Subcommittees

Subcommittees have been constructed with an eye to maintaining logically coherent clusters of topics:

Technology, Systems, and Engineering

Specific Application Areas

Games and Play

Social Computing and Computer-Supported Cooperative Work

User Experience and Usability

Design

Interaction using Specific Capabilities or Modalities

Understanding People: Theory, Concepts, Methods

Interaction Techniques and Devices

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Under “The earlier CHI contribution types embodied a

Inter mix of concerns—not only types of knowledge, but also types of work, substantive concerns, and methodological approaches.”

# CHI 2016 Data

## CHI 2016 by Contribution Type

(2316 submissions, 546 acceptances, 23.6%)

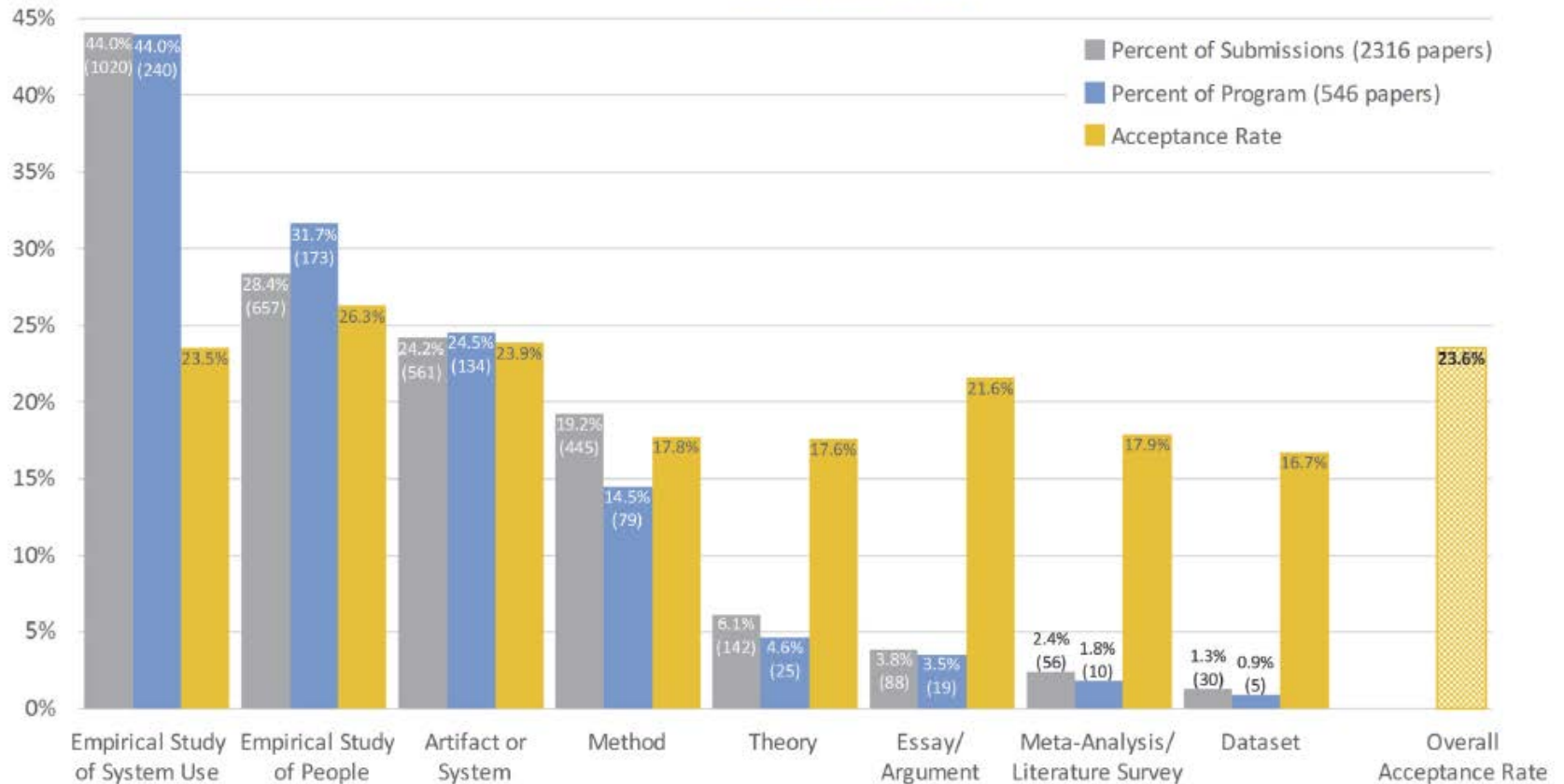
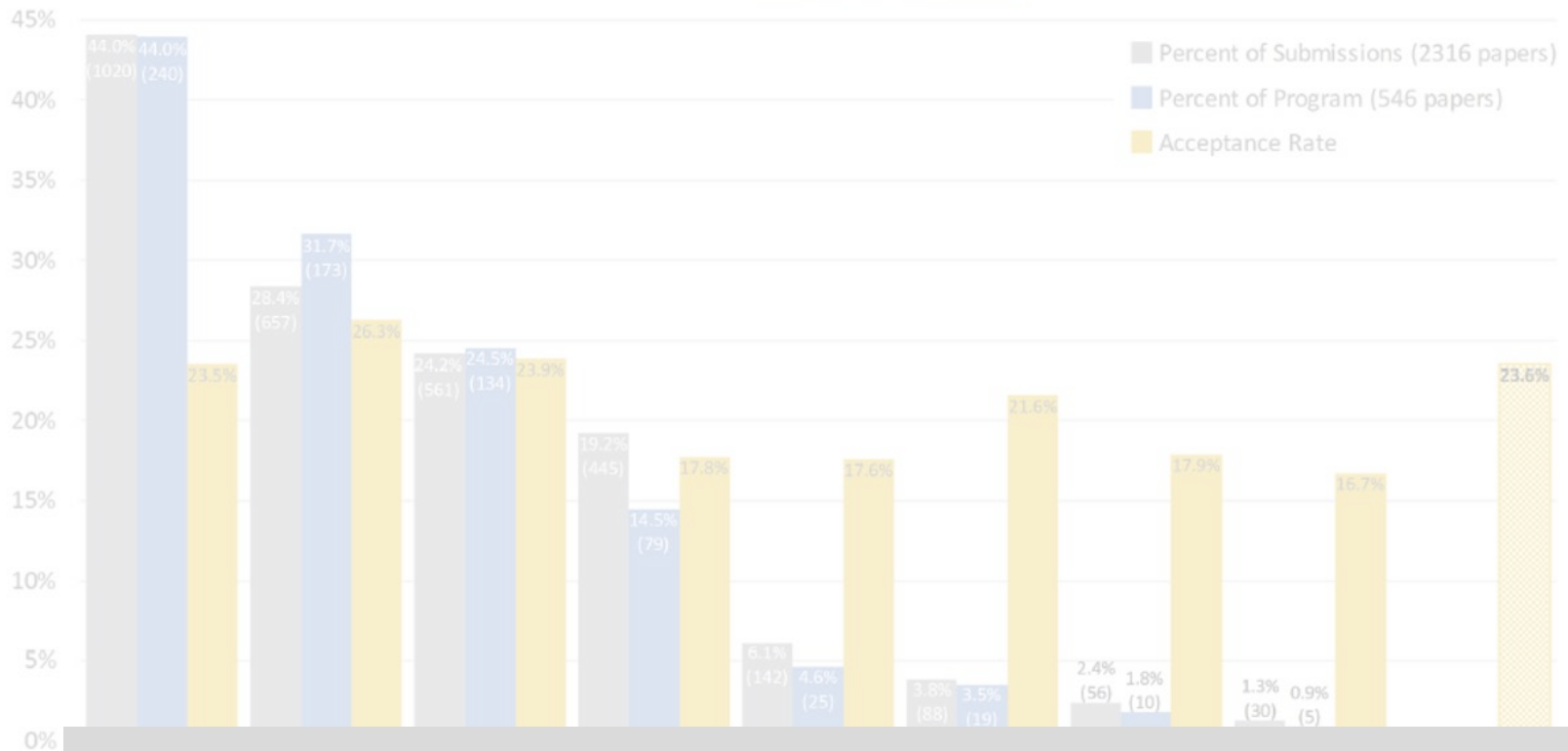


Figure 2. CHI 2016 submissions and acceptances by contribution type, sorted by descending number of submissions.

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“We stress that the level of research activity should not be confused with the value placed on particular contribution types once they are published.”

# On Evaluation

These leave a lot of room for evaluation

Quantitative / Qualitative in same category

Systems / Techniques in same category

Additional readings will explore perspectives targeted to specific topics and contributions



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