WHERE ARE MARGINALIZED COMMUNITIES IN CYBERSECURITY RESEARCH?

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Abstract

We systematically analyzed recent security, privacy, and cybersecurity research to investigate the frequency and nature of engagement with marginalized communities.

Through a novel framework, we contribute to the study of marginalization within cybersecurity and S&P research. Our work categorized existing literature by four different commonalities: efforts to support, methods of inquiry, findings, and specific marginalized communities.

Count of Marginalized Papers by Venue

Venues
- Association of Computing Machinery Digital Library
- Institute of Electrical and Electronics Engineers Digital Library
- Proceedings on Privacy Enhancing Technologies
- Symposium on Usable Privacy and Security
- USENIX Conference Papers

ACM had the highest number of marginalized papers (19), followed by USENIX (5) and IEEE (3)

Methodology

Data Collection: Designed a search query to collect 2,170 privacy and cybersecurity papers over the last two years across five different venues.

Data Analysis: Annotated each paper based on methodology, whether or not the paper centered on marginalization, and if it did, whether it sought to support or study the marginalized community involved.

Classification: Methodologies were categorized into four groups based on their primary procedures.

Framework Analysis: Developed and applied a three-prong analysis to each paper concerning marginalization. We determined how groups are defined, what problems are addressed, and which approaches are utilized.

How is Marginalization Operationalized?

Supported

Interventions:
Papers that have successfully implemented and evaluated security and privacy interventions for marginalized communities.

Evidence-Based Practices:
Papers that use strategies that have been shown to enhance security/accessibility for marginalized groups.

[4], [6], [9] ,[11], [17], [21]

Methods

Interviews:
Papers that studied security needs of marginalized communities is direct interviews.

Data Analysis: Papers that fall under this section had emphasis on the use of statistical tools to derive insights and solutions.

[2], [5], [6], [7], [9], [12] ,[13], [14], [15], [16], [17], [18], [19], [21], [22], [24], [25], [26], [27]

Findings

Frameworks:
Papers proposing a Framework that evaluates security measures for vulnerable groups.

Inclusive Security Designs:
Papers focused on designing and developing technologies and protocols to enhance security system accessibility and effectiveness for marginalized communities.

[1], [3], [4], [8], [9], [11], [12], [15], [20], [22]

Communities

People with Disabilities:
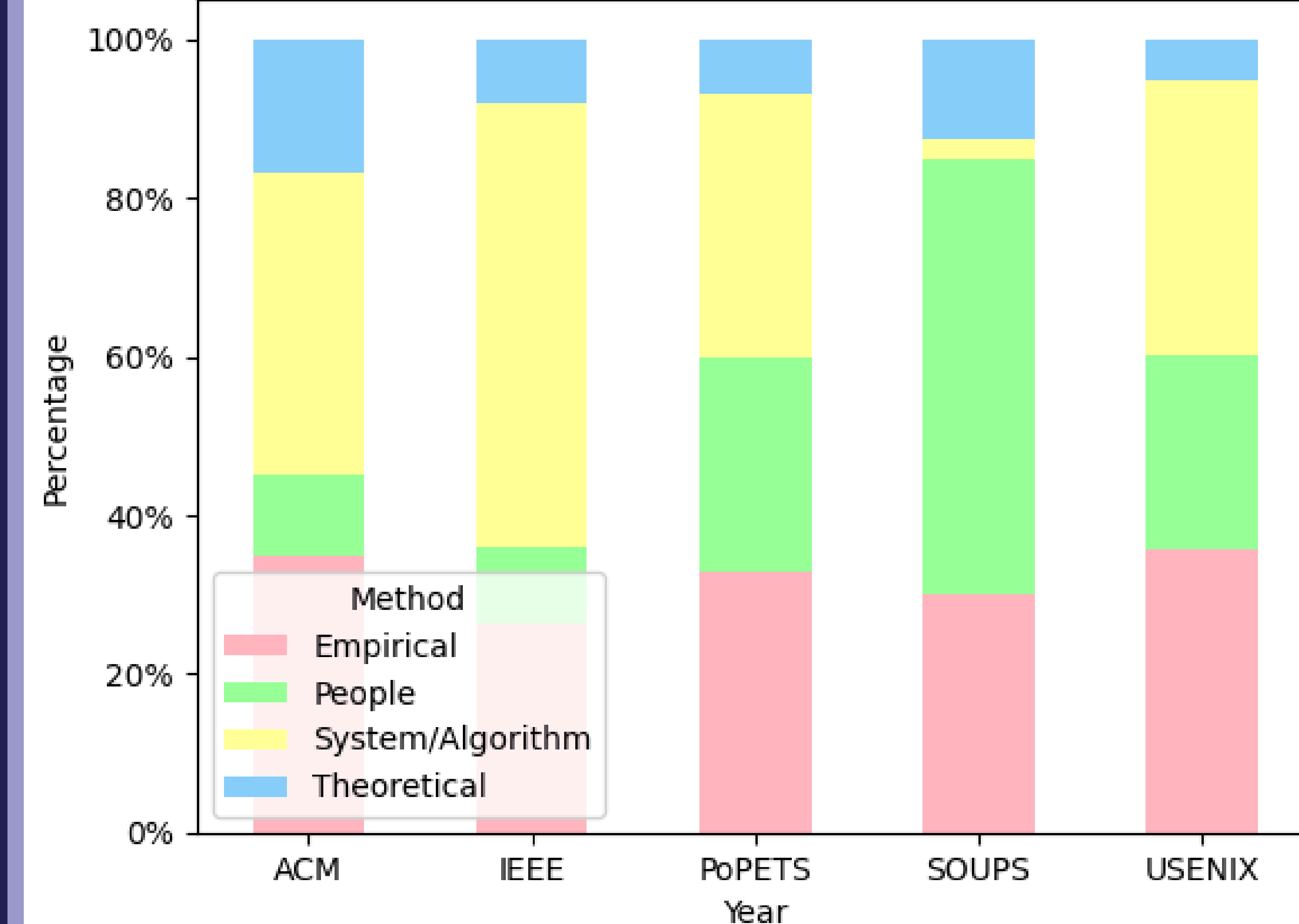Papers that identify people with disabilities as their marginalized community.

Low SES:
Papers that identify people that are low socioeconomic status (SES) and their challenges with cybersecurity.

[2], [3], [5], [9], [10], [12], [13], [14], [15], [16], [18], [21], [22], [25]

Full Dataset Paper Distribution

2023
2022
No Discussion of Marginalization
Studying Marginalization
Marginalized Communities
Supporting Marginalized Communities

In the last two years: 0.97% of papers involved marginalization, 18% of marginalized papers supported groups

What Methods do Venues Use?

Relative Percentage of Methods by Venue

Method
- Empirical
- People
- System/Algorithm
- Theoretical

System Development was the most common method in most venues; SOUPS prioritizes people

Theoretical papers included those that developed or discussed new conceptual frameworks, theories or models relating to privacy, security, cybersecurity, as well as literature reviews with findings.

Empirical papers employed quantitative methods, such as experiments or mathematical analyses, to collect and analyze data or qualitative methods such as observation, focus groups, or content analysis, to gather and interpret data on privacy and security.
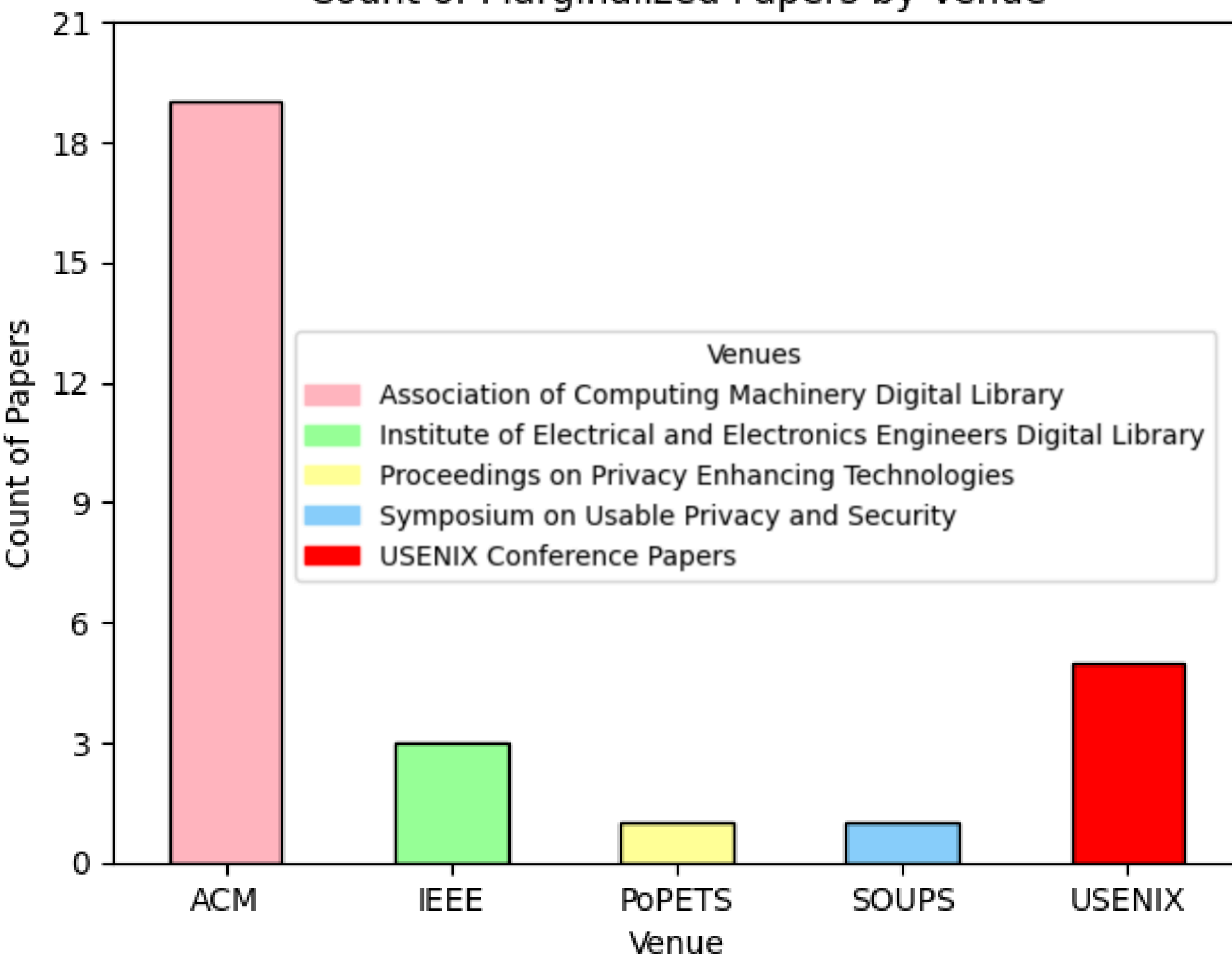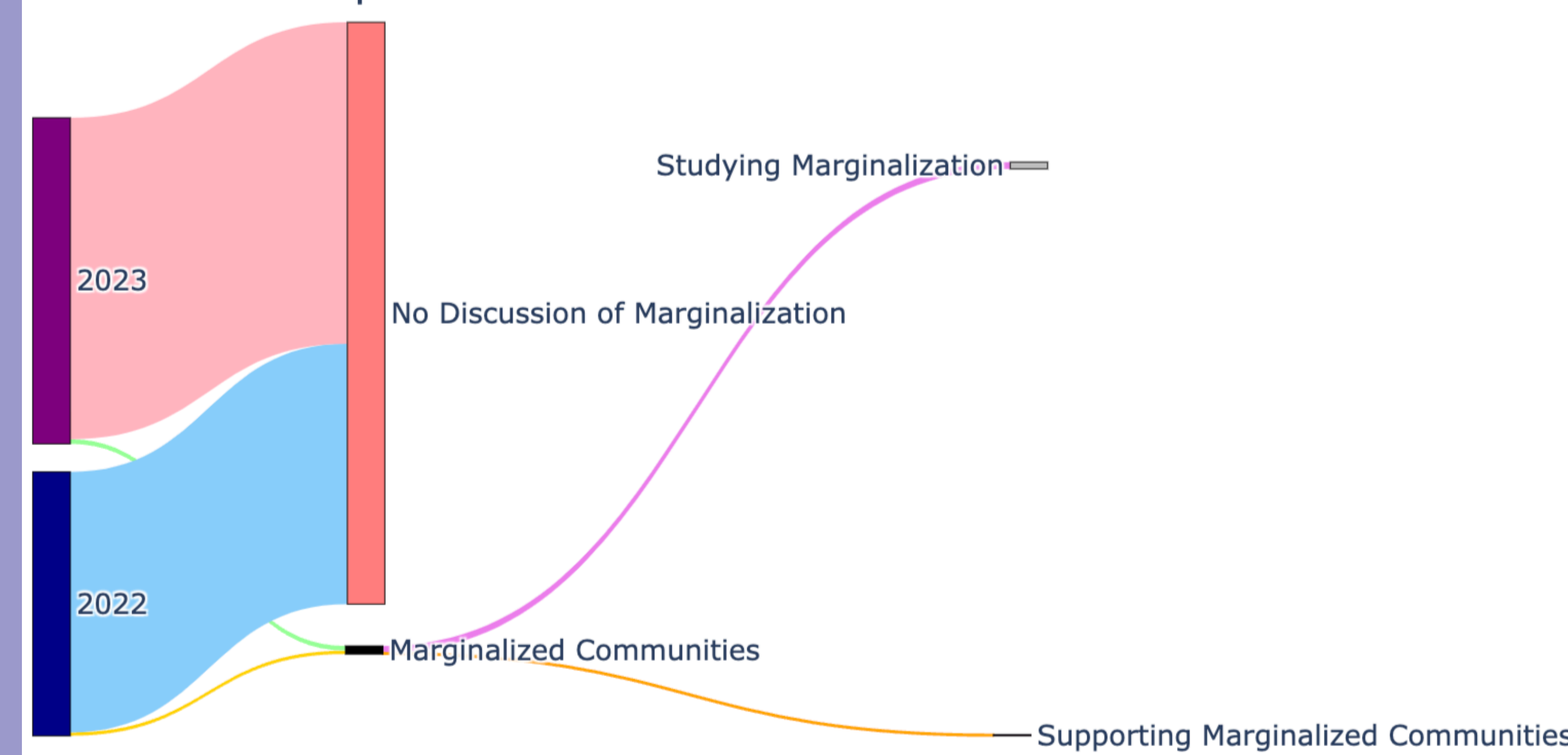
System/Algorithm papers involved the design or development of new systems, algorithms, or prototypes that were looking to enhance online privacy and security.

People focused papers involved directly interacting with people through methods such as user-centered design, community-based research, and interviews; i.e. the papers that prioritized community engagement and collaboration throughout the research process.

Acknowledgement