Representation of Women in HPC Conferences

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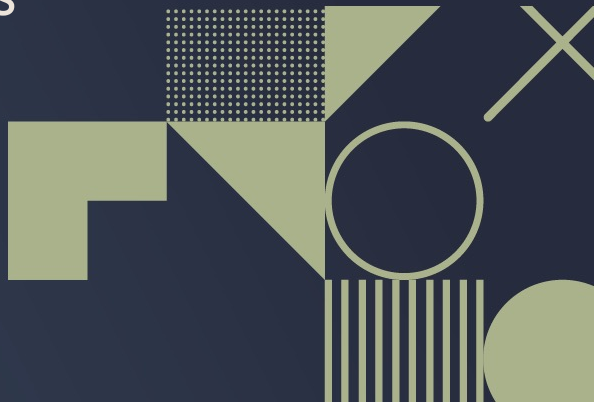
SC'21

November 16th 2021




SC2001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IGNITING INNOVATION


SC11
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Connecting
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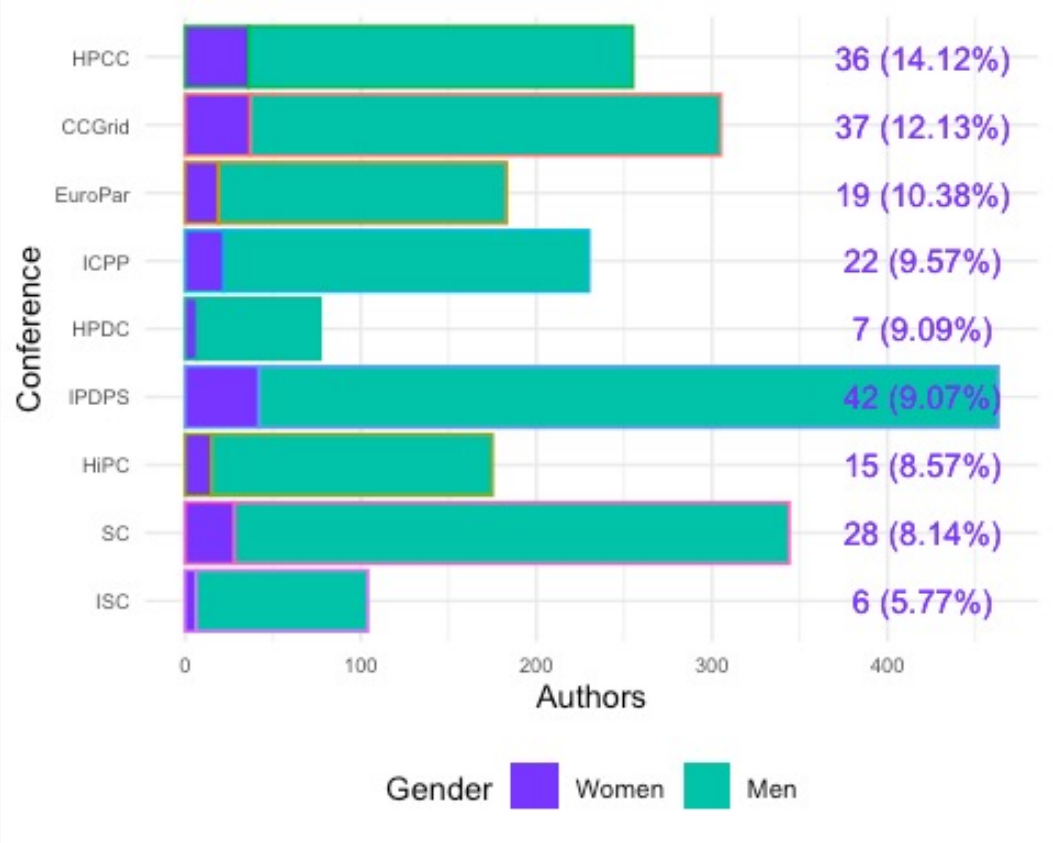
Conferences

Conference	# Papers	# Authors	Acceptance rate	Country
IPDPS 2017 ORLANDO	116	447	22.8%	USA
HPCC 2017	77	287	43.8%	Thailand
CCGrid2017	72	296	25.2%	Spain
SC17 Denver, CO hpc connects.	61	325	18.7%	USA
INTERNATIONAL CONFERENCE ON PARALLEL PROCESSING	60	234	28.6%	United Kingdom
Euro-Par 2017	50	179	28.4%	Spain
हाइपीसी HiPC	41	168	22.3%	India
ISC High Performance The HPC Event.	22	99	33.3%	Germany
HPDC'17	19	76	19.0%	USA

Data sources

- Conference web pages and proceedings: researchers' names and affiliation; papers; coauthors.
- Google Scholar: Researcher affiliation; bibliometrics.
- LinkedIn, home pages: researchers' perceived gender; affiliation.
- Manual approach limits scalability but is more accurate than inferential approaches.
- Geographic and sector data also had to be mapped manually from affiliation for better accuracy.
- Not all papers are HPC-related, but the differences are nonsignificant.

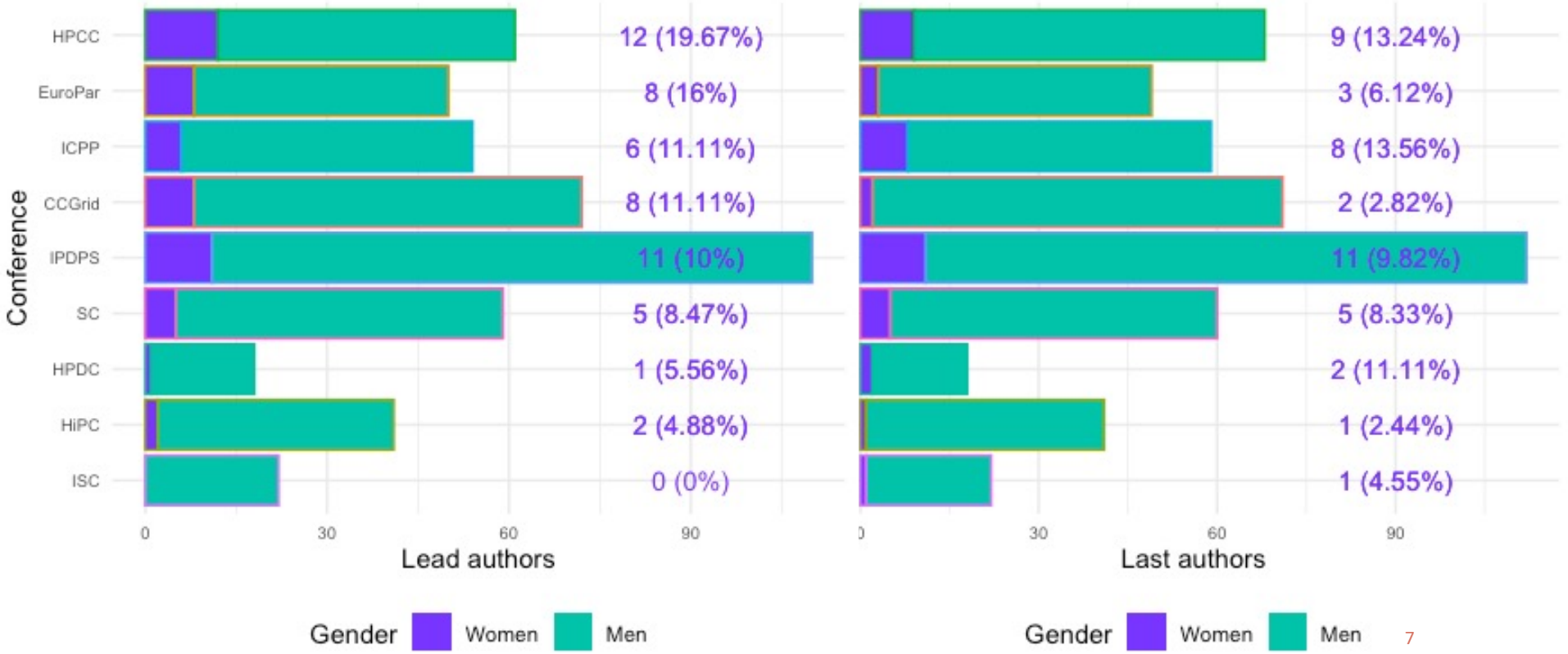
Female author ratio



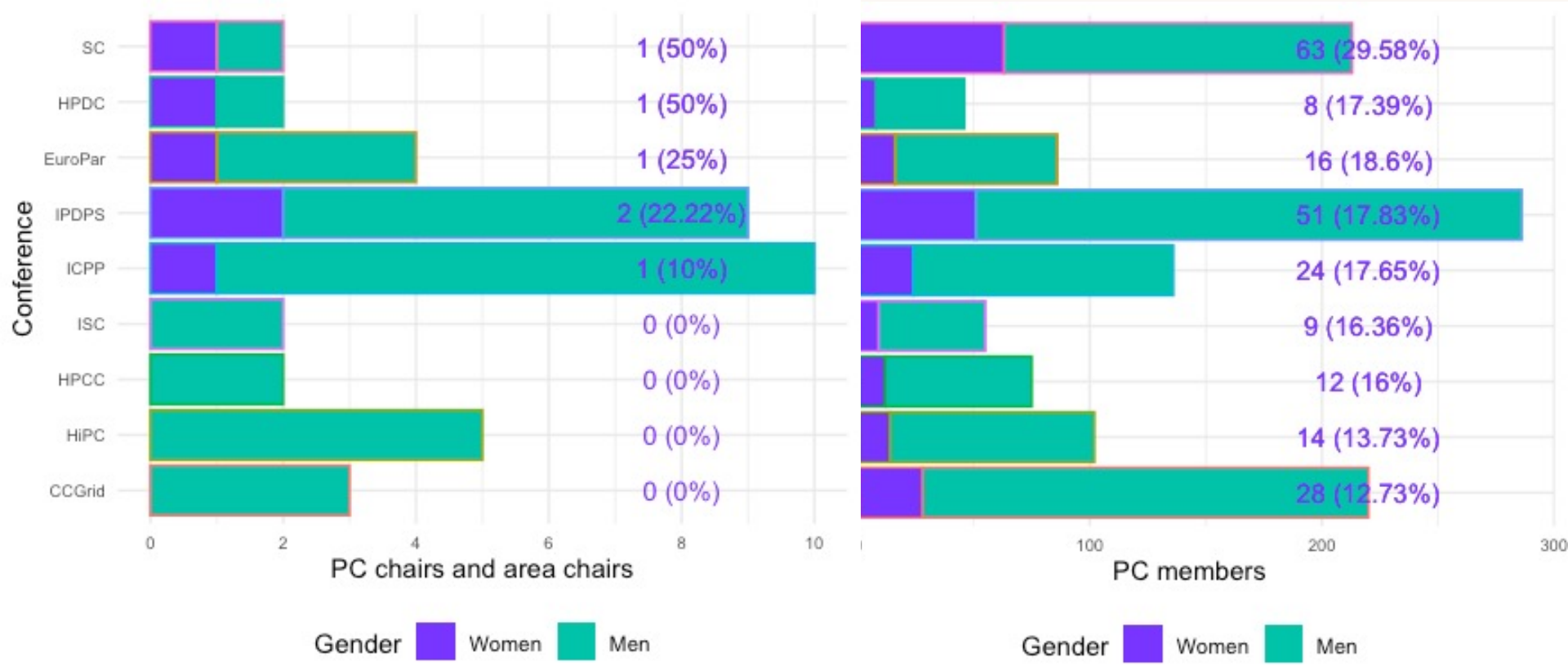
Overall FAR: 9.9%

Lead author

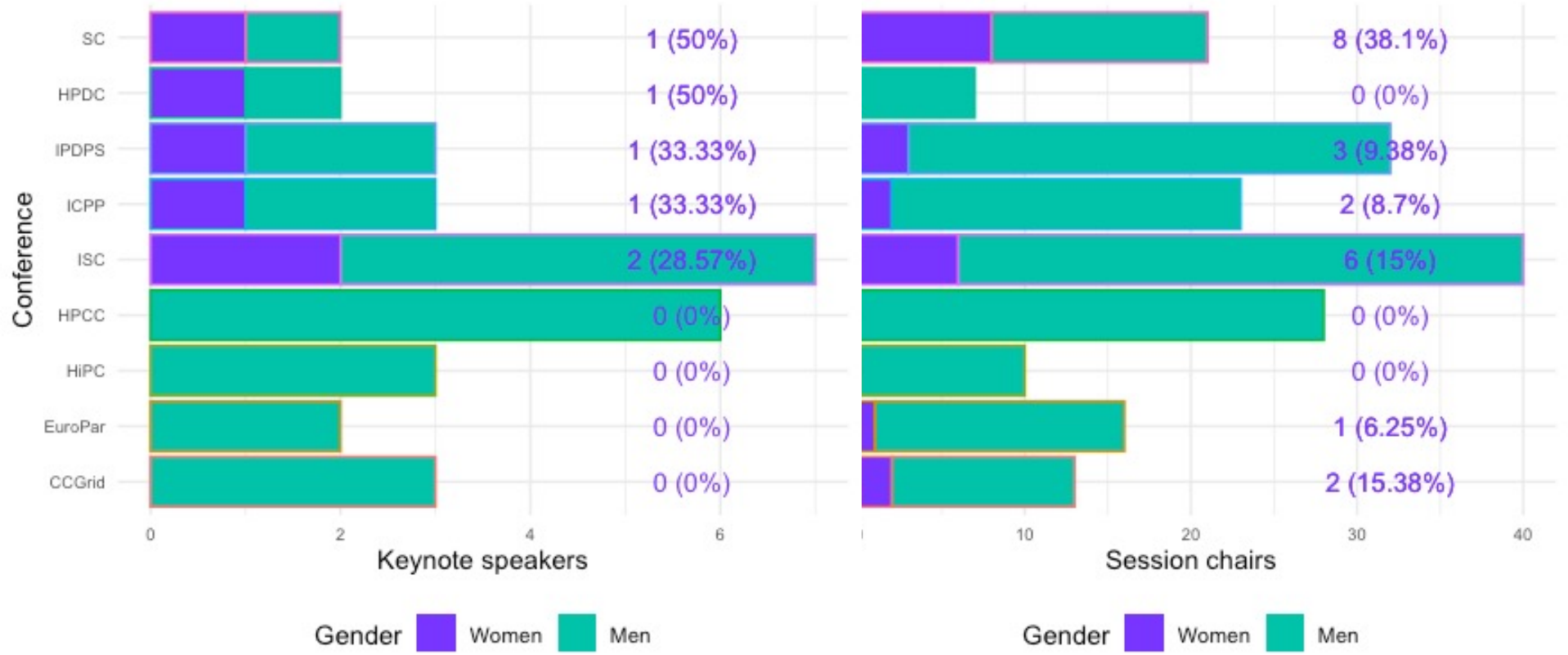
Last author



Composition of program committee



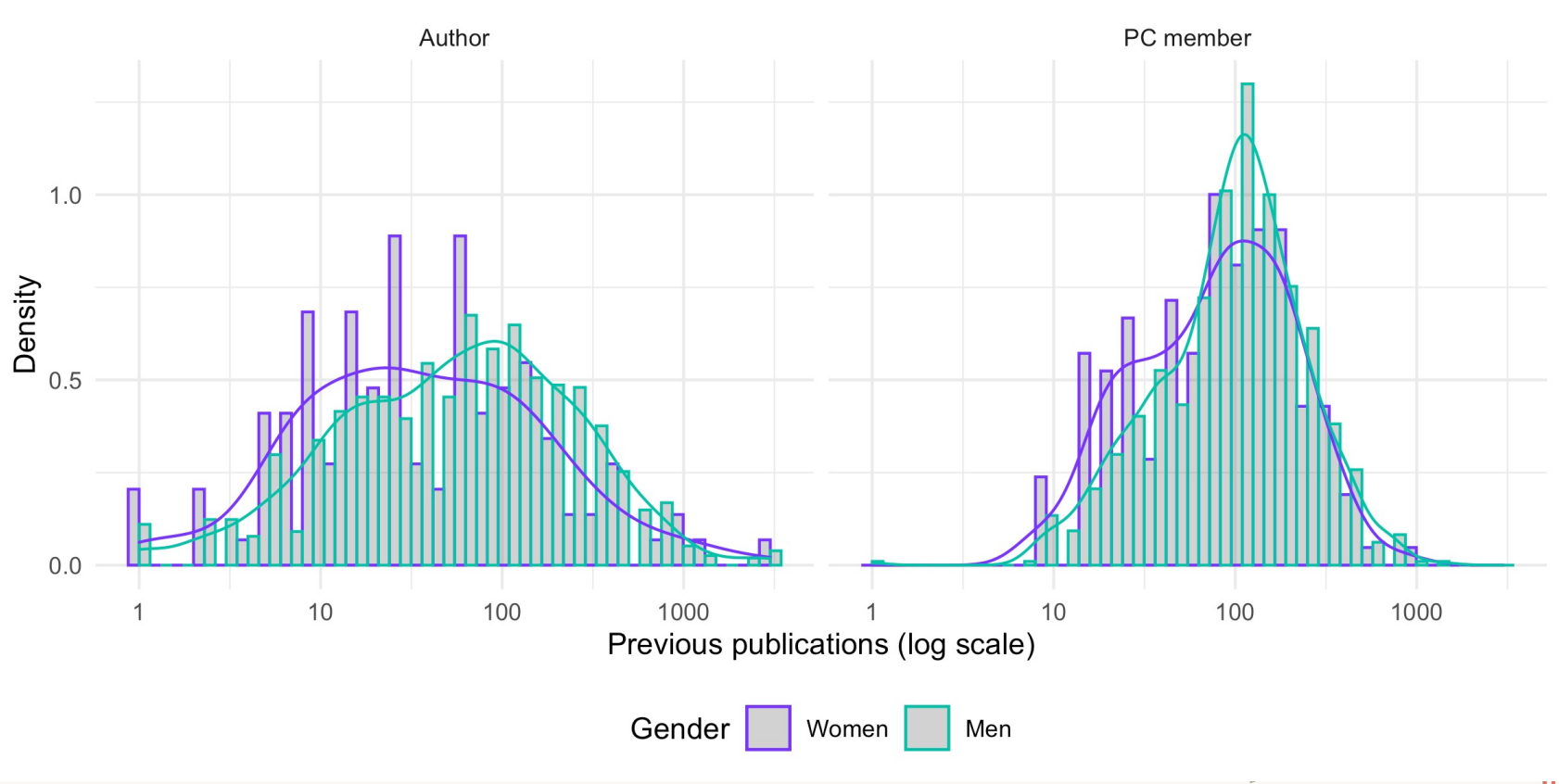
Visible roles



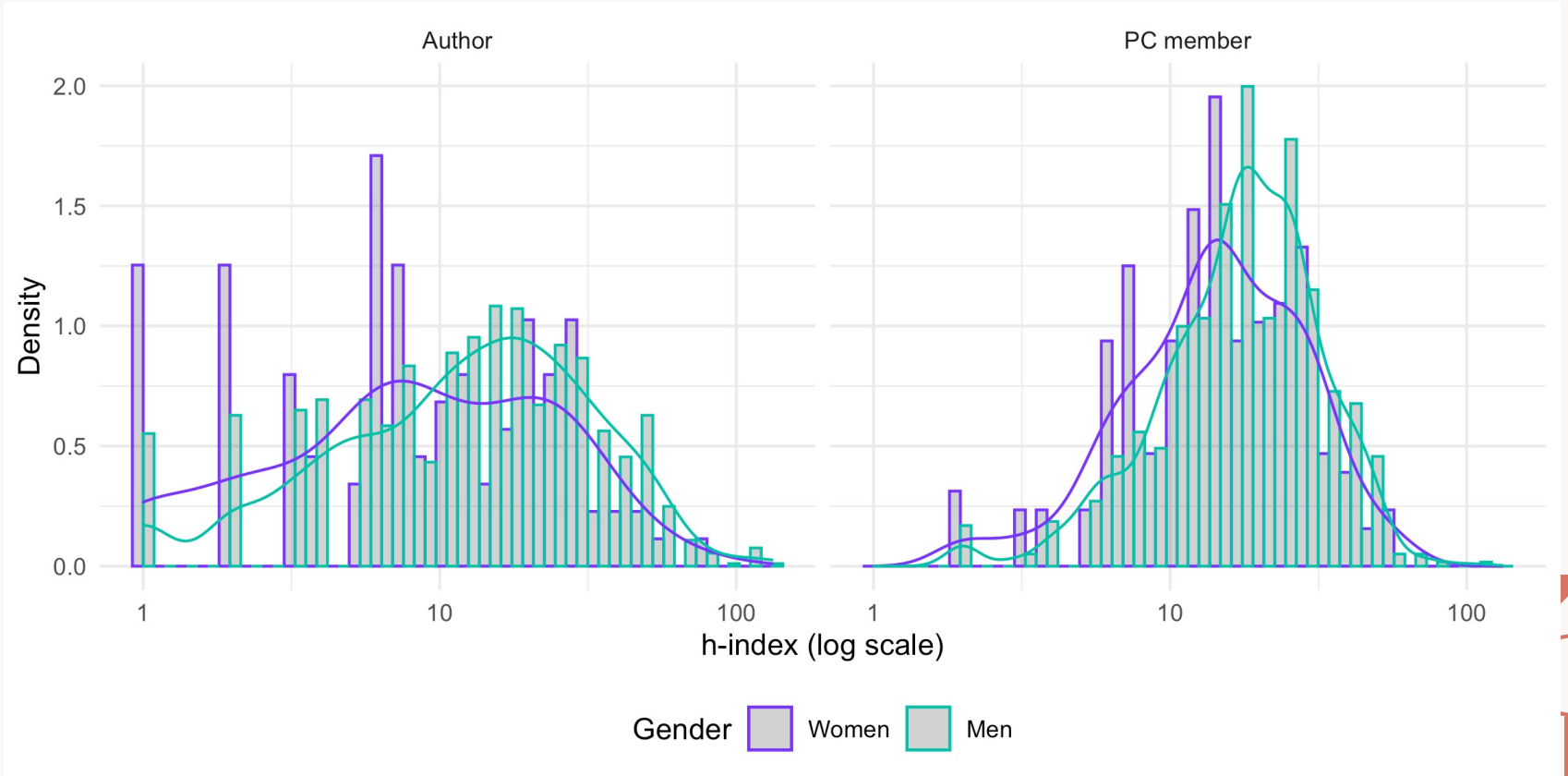
Demographic questions on authors

- Are there differences across genders in research experience?
- Are there differences across genders in affiliated work sector?
- How does gender representation vary by country of affiliation?

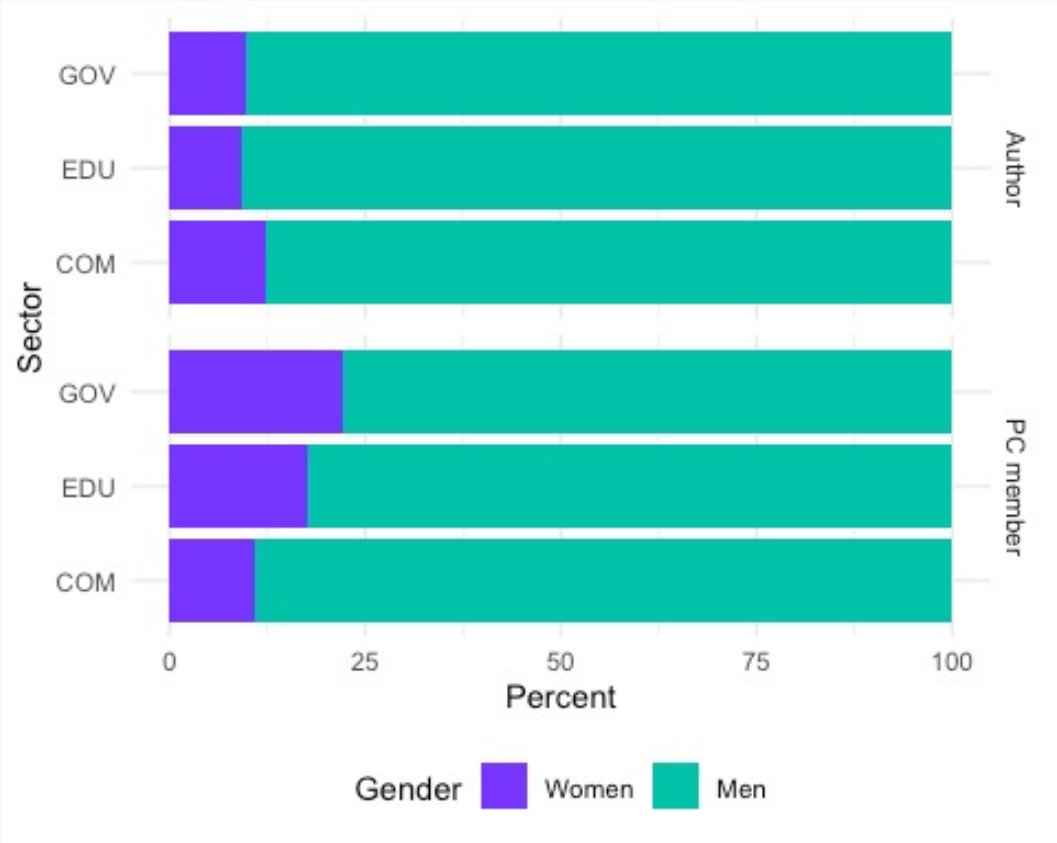
Researcher experience: number of publications



Researcher experience: h-index



Work sector



Overall 72.8% of unique researchers from academia, 18.6% from government, and 8.6% from industry

Ten largest countries for researcher affiliation (PC + authors)

Country	Ratio of women	Total researchers
United States	15.38%	1,408
China	10.43%	200
France	13.61%	147
Germany	8.63%	139
Spain	8.94%	123
India	5.63%	72
Switzerland	14.06%	64
Japan	1.59%	63
United Kingdom	7.69%	52
Canada	6.82%	44

Highest author count and representation of women

Representation of women not linked to author count or economic development

Affiliation by region

Region	Authors		PC members	
	Total	% Women	Total	% Women
North America	930	9.78%	523	24.47%
Western Europe	256	8.98%	159	16.35%
Eastern Asia	201	11.94%	69	2.90%
Sothern Europe	106	6.60%	80	12.50%
Northern Europe	65	7.69%	50	8.00%
Southern Asia	63	6.35%	20	5.00%
South America	36	8.33%	11	27.27%
Australia and NZ	24	8.33%	14	---
Western Asia	22	27.27%	24	12.50%
South-Eastern Asia	20	5.00%	4	---
Eastern Europe	12	---	17	11.76%
Western Africa	2	50.00%	---	---
Central America	1	100.00%	---	---
Central Asia	1	---	---	---
Northern Africa	1	---	---	---

A full half of authors are from the US

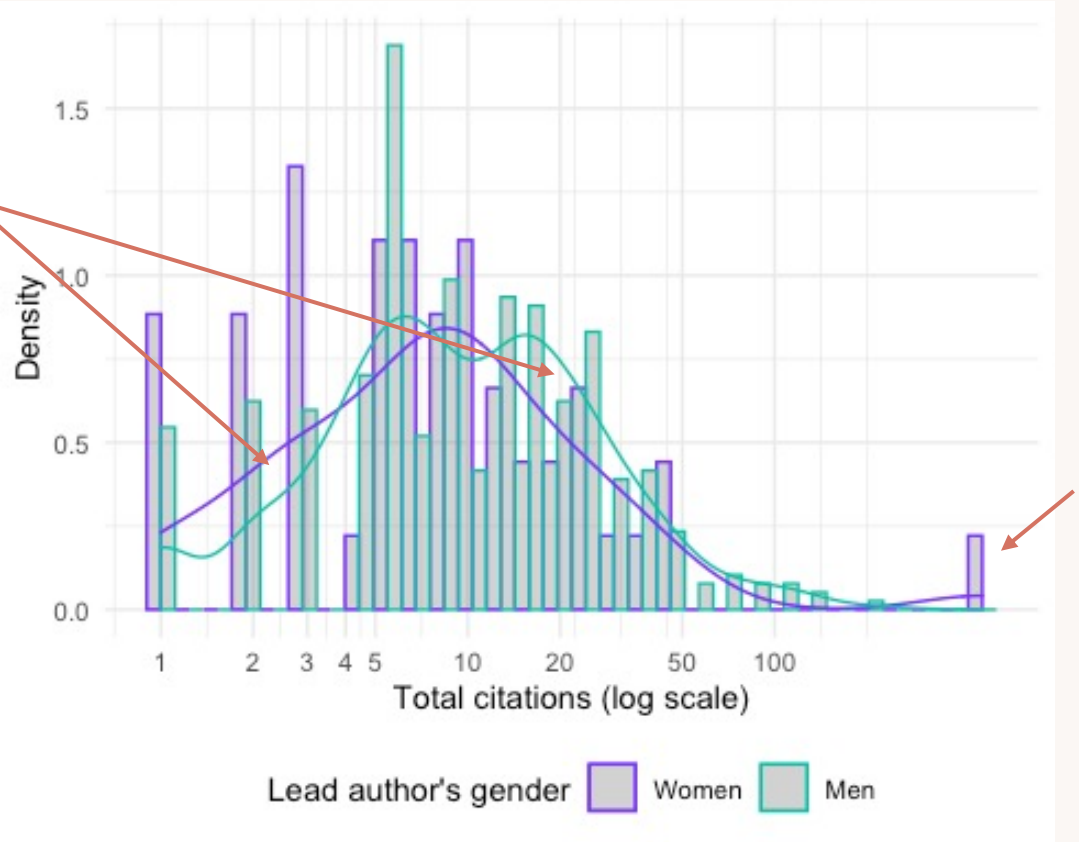
Another 14% from Western Europe

Western reviewers aren't significantly overrepresented compared to authors

Representation of women among PC nearly twice as much as among authors

Paper citations four years later

Most citations of female lead authors left of men's

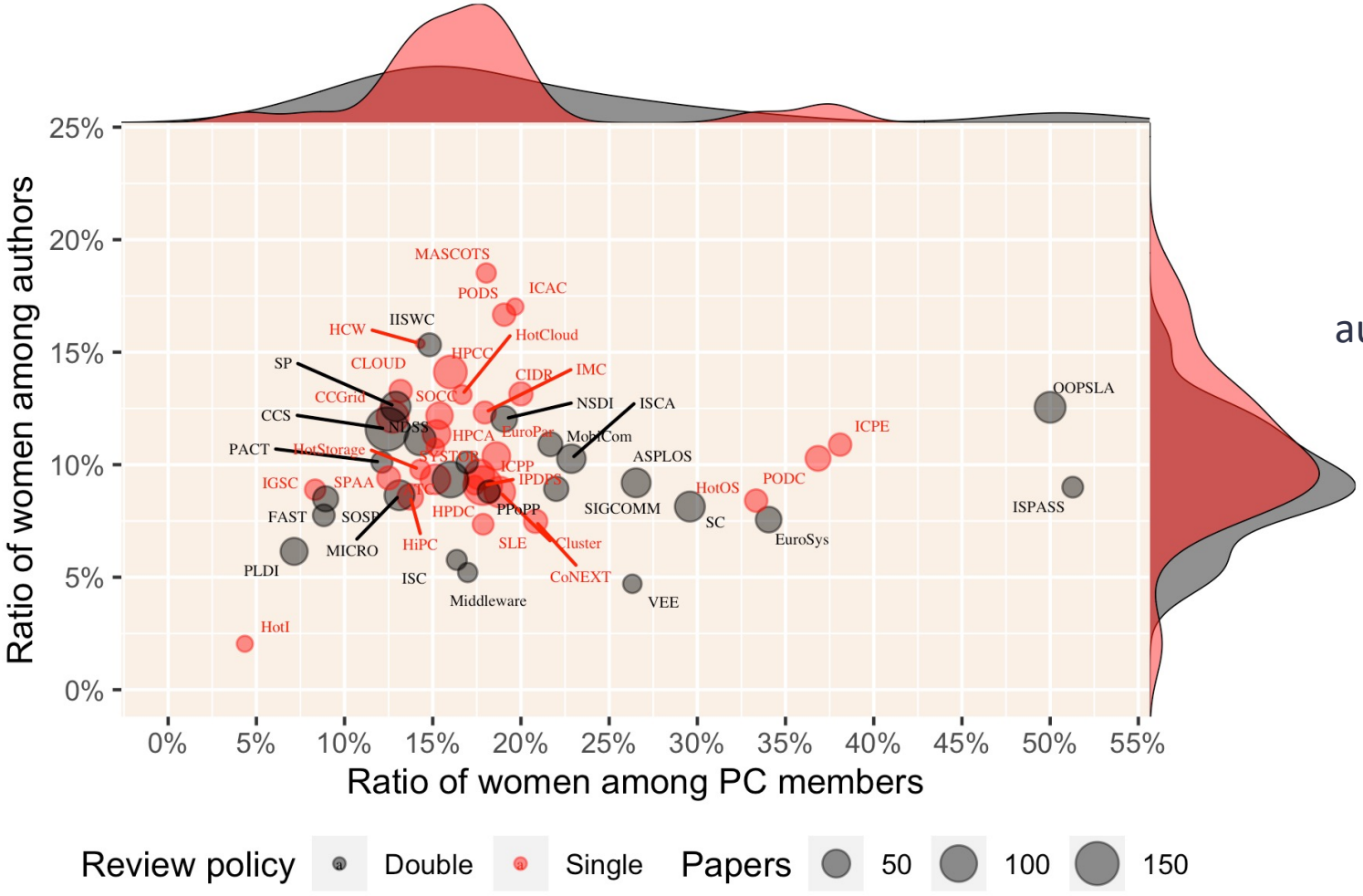


Women average about 19 citations vs. men's 15

Unless you omit the one outlier paper, then women average 10 . Medians are women: 7, men: 8

Ongoing work

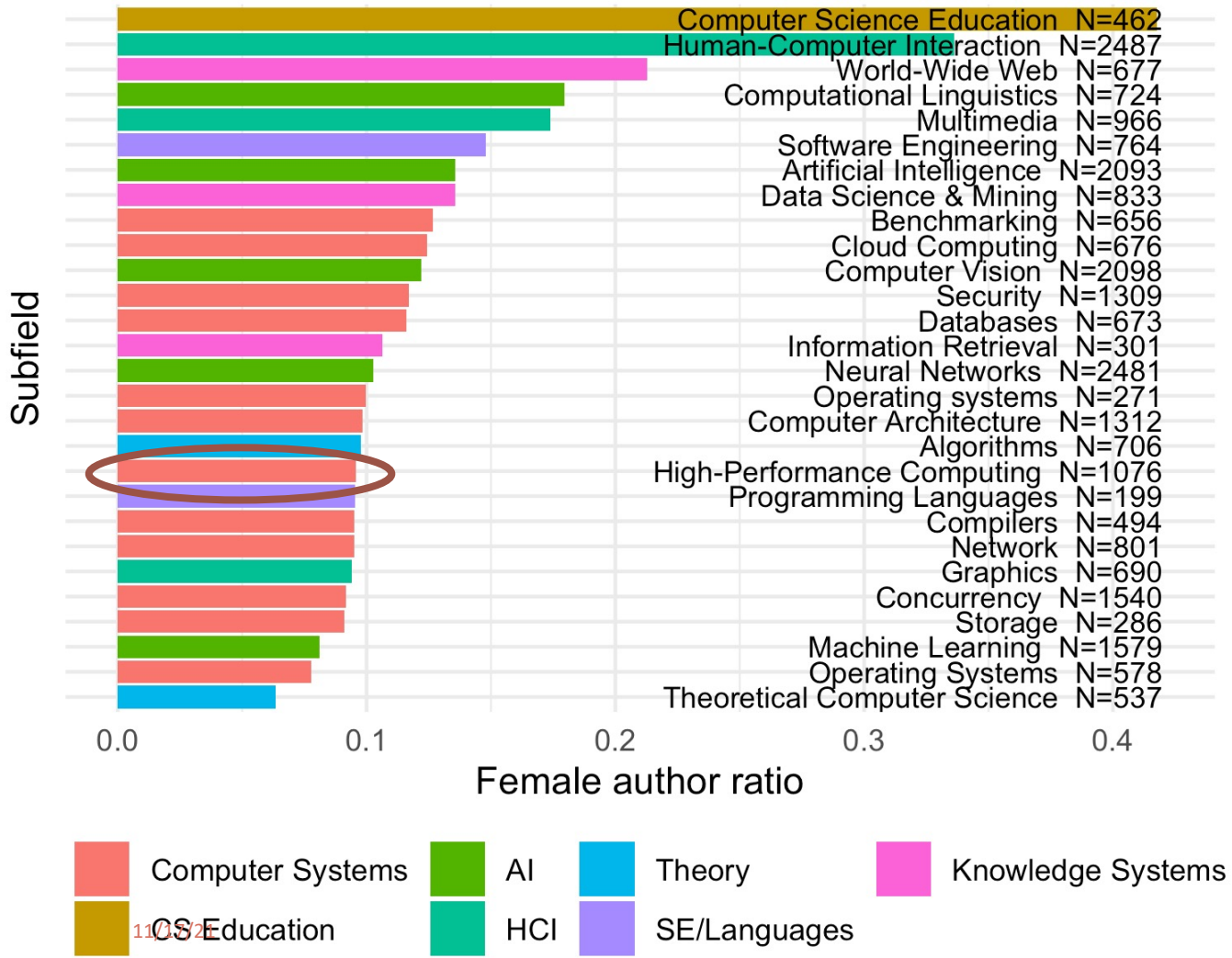
- Expanding the analysis to more conferences across all systems subfields
- Comparing systems to other CS fields
- Collecting evidence for causal factors for low representation
- Examining collaboration patterns



Systems conferences

No correlation between female author ratio and ~25 conference factors Including diversity initiatives

Cross-field comparison



Speculations on causes of low female representation in systems

1. Relative dearth of female peers and mentors.
2. Gender gap in pre-college low-level programming experience.
3. Higher attrition rates for women.
4. Research in systems and HPC is more expensive.
5. Higher collaboration requirements in systems research.

…

Summary

- HPC is still very far from gender parity.
- In most countries and geographical regions, fewer than 1 in 10 HPC authors is a woman.
- Women also:
  - are underrepresented in visible conference roles
  - may be overrepresented in program committees, a mixed blessing.
  - exhibit lower research experience and last-author roles, possibly owing to higher attrition
  - do not appear to be underrepresented as lead authors, but they receive fewer citations.
- This data can be used as a baseline to measure progress against.

Code and data can be found at github.com/eitanf/sysconf
Further questions: eitan@reed.edu