How Computer Science Research can Perpetuate Inequality and Bias

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The question is "How Computer Science Research can Perpetuate Inequality and Bias".

First it is necessary to understand what Computer science research is. In the wider scope of things, computer science is about processing information, and ways to automate the processing of information. The more is research about how information processing can be automated and the better humans understand it, the wider range of possibilites begin to exist for how to use the technology in the real world.

Once the possibilites for applying technologies exist, business and organisations will seek to implement the relevant subset of the new technologies as part of their operations. This generates a requirement for business to gather people that are able to implement these technologies.

The profession that becomes in demand in order to implement these information processing technologies are ICT specialists (Information and Communication Technology.

Stats reviewd by europa.eu/eurstat makes it clear that ICT roles are increasing. [4]

So one effect of Computer Science research is an increased number ICT specialists in demand, how does this perpetuate inequality and bias?

There exists a huge disproportion in terms of the ratio of men to women that are employed as ICT specilaist, as of 2016, in the EU, out of all ICT speicalists only 16% were women, as mentioned in an article by the Euruopean Data Journalism Network [1].

This is concerning as one of the most impactful aspects that determine what the new generation of people decide to go into are role models. The study carried out by Marx, D. M. and J. S. Roman [2]. revealed that female students learning about a competent female experimenter buffer womens self-appraised maths ability, which in turn led to successful performance on a challenging maths test.

It seems that a lack of women specialising in ICT could limit the spectrum of of options a young girl will think about when forming a vision of her future.

This is concerning as the median slary for ICT specialists is much higher

than the median salary of other fields. This is another aspect in which equality is being reduced.

Another way in which this may create bias is that having a low number of women in ICT can create false perceptions of a womens ability to do certain tasks, as was shown in a study where womens code changes to programmers code bases were being accepted less once the it was evident the person was a woman. When the identity is anonymous, women have a higher percentage of accepted code changes [3].

The way in which this ties into Computer Science research is that if the rate of change of women joining ICT (inspired by activism for example) stays lower than the rate of demand created from new technology being researched, then inequlaity and bias will be perpetuated.

[1] https://www.europeandatajournalism.eu/eng/News/Data-news/The-ICT-sector-is-boomi
-But-are-women-missing-out

[2] Marx, D. M. and J. S. Roman. "Female Role Models: Protecting Women's Math Test Performance." Personality and Social Psychology Bulletin 28 (2002): 1183 - 1193.

[3] Terrell J, Kofink A, Middleton J, Rainear C, Murphy-Hill E, Parnin C. 2016. Gender bias in open source: Pull request acceptance of women versus men. PeerJ PrePrints 4:e1733v1 https://doi.org/10.7287/peerj.preprints.1733v1

[4] https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_specialists_-_statistics_on_hard-to-fill_vacancies_in_enterprises#Employment_and_recruitment_of_ICT_specialists