Professors working to eliminate gender-biased 'bugs' in open-source software

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The cycle of open source software (OSS) development and gender representation is, perhaps, unsurprising—women are vastly underrepresented among OSS developers. As a result, women miss out

on development and professional opportunities, and as jobs in OSS development open up, women lack the experience to get them. And the cycle continues.

It's so pervasive that it's likely built right into the software itself, say four researchers, which is an entirely separate problem—one they're aiming to resolve through finding these bugs and proposing redesigns around them, leading to more gender-inclusive tools used by software developers.

Anita Sarma, a professor from Oregon State University, and Igor Steinmacher, an assistant professor in the School of Informatics, Computing, and Cyber Systems, are the PIs, with Marco Gerosa, associate professor in SICCS, and OSU professor Margaret Burnett, who has focused on this question throughout her career, are co-PIs.

They will investigate OSS support tools like Eclipse (development editor), Git (version control), GitHub (project hosting site), Jira (issue tracker), Hudson (continuous integration) and others, with the hypothesis that if these tools are implicated in creating gender-biased barriers, they can significantly discourage newcomers, especially women, from joining OSS projects.

"We are interested in how people use tools because the 'bugs' may be embedded in how the tool was designed, which may place people with different cognitive styles at a disadvantage," Steinmacher said. "This is because there are differences in how people problem-solve and use software features. Interestingly, the literature shows that these difference in problem-solving styles cluster by gender. Therefore, if someone implements a tool without considering a diverse set of users, they may include such kings of bugs, which affect one gender more than the other."

The study will build on previous research from Burnett, whose team pioneered the GenderMag research technique, to find gender-bias "bugs." GenderMag is an inspection method that enables software professionals to find bugs in their own software using four gendered personas. The tool builders will do cognitive walkthroughs of their software and answer specific questions through the lens of each persona's problem-solving facets.

The facets to be considered are:

1. Motivations
2. Computer self-efficacy
3. Risk aversion with technology
4. Information processing styles
5. Styles of learning new technology

Based on the bugs found, the team will propose ways to redesign the OSS documentation; these redesigns and the process of creating inclusive tools will be empirically evaluated to create a list of best practices for fixing gender-bias bugs in both products and processes.

"Some research efforts are investigating how gender biases play out in OSS projects," Steinmacher said. "Those focus in part on identifying potential social and cultural issues that particularly discourage women from joining OSS communities. Other studies focus on the types of problems that women face when participating in such male-dominated communities. Our research complements these works on social factors by focusing on understanding whether and how the tools and infrastructure that people use to contribute to OSS are complicit in creating these biases."

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