

# How race affects judgements of software developers' work

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Researchers have found that the perceived race and ethnicity of a software developer based on their online name may determine how their open-source software projects are judged by others.

In GitHub, one of the main online platforms for software developers, the quality of a coder's contributions is evaluated by other developers on the platform. GitHub discussions are online, and users only see the name of a contributor. And in an open-source software development context, users discuss their contributions through what are known as "pull requests," the system on GitHub to propose and collaborate on changes in a software repository.

"A developer's contributions to an open-source software project are accepted or rejected for a variety of technical reasons, but our analysis of tens of thousands of projects on GitHub shows that contributions can be accepted or rejected because of other factors," said Mei Nagappan, a professor at the University of Waterloo's Cheriton School of Computer Science. "We found that one of them is the perceived [race](#) and ethnicity of a developer based on the person's name on the platform."

Nagappan led a research team that conducted an analysis of projects on GitHub, examining more than two million pull requests across more than 37,700 open-source projects involving nearly 366,000 developers.

The researchers estimated the race and ethnicity of developers based on their GitHub names using a tool called NamePrism that determines what is the likely perceived race and ethnicity by others when all they see is a name. They found that 70 per cent of the contributions that were integrated into an open-source software project were submitted by developers perceptible as white. Developers who were perceptible as Asian, Hispanic and Black had less than 10 per cent of the contributions in total that were accepted to open-source software projects.

"This low percentage is concerning because it does not reflect the percentage of developers among these groups in the larger tech community," Nagappan said.

The researchers also found that the odds of a contribution being accepted by GitHub project integrators was lower from developers who are perceptibly non-white.

"Perceptible Hispanic and Asian developers had six to 10 per cent lower odds of getting their pull requests accepted compared with perceptible white submitters," said postdoctoral researcher Gema Rodríguez-Pérez. "We need to identify the problems, understand why the problems exist, and determine what interventions can help reduce and eliminate bias."

**More information:** Reza Nadri et al, On the Relationship Between the Developer's Perceptible Race and Ethnicity and the Evaluation of Contributions in OSS, arXiv:2104.06143 [cs.SE]  
[arxiv.org/abs/2104.06143](https://arxiv.org/abs/2104.06143)

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