

## USC Professor Shrikanth Narayanan: software pioneer

Professor Shri Narayanan of the USC Viterbi School of Engineering is leading the development of the Geena Davis Inclusion Quotient software, a program that analyzes gender in entertainment through the breakdown of screen and speech time for males versus females. His pioneering work was recently featured in *The New York Times* and *The Washington Post*.

Photo by Jon Vidar



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### The Washington Post

## Women in Hollywood get less screen time than men. This technology could help fix that.



Brie Larson appears backstage with the award for best actress in a leading role for "Room" at the Oscars on Feb. 28. *Matt Sayles/Invision/AP*

By Steven Overly

**Engineers have created software that** parses through every scene, line and frame in a movie to determine exactly how much screen and speech time female characters are given compared to their male counterparts. Their findings: As in many other professions, women get the short shrift.

But the technology may do more than provide new evidence of the sexism that Hollywood observers and outspoken actresses have long lamented. It also could help expose the unconscious biases that lead to cinematic gender disparity well before a script is finalized or an editor's cuts are approved.

Creators from Google and the University of Southern California say movie studios could use the software to analyze the text of a script to see how many lines are allocated to male vs. female characters, or to assess whether the proportion of time on screen for men and women is equitable. Movie studios were engaged

throughout the development process, they said, although it's unclear whether any plan to use it to analyze unreleased content.

Of course, some films will have an inherent bias. A biopic or historic film cannot exactly write characters in or out of the story based on their gender. In other instances, however, a director may choose to show a man on the screen when a woman is talking, or a writer may assign dialogue to a man that a woman could deliver just the same.

"This is not meant to be something that limits creativity. It's meant to be a tool that helps in the creative process," said Hartwig Adam, a senior staff engineer at Google.

In the future, the software could also do the same for characters of different races, physical abilities or other observable attributes.

"This is our very first [application] of our tool and its analysis," said USC engineering professor Shri Narayanan. "Our bigger

road map that we've been dreaming up is to look at different representations in media."

The project was spearheaded by the Geena Davis Institute on Gender in Media, a research institute founded by the "Thelma & Louise" actress at Mount Saint Mary's University in Los Angeles. To develop the software, the organization marshaled a team of engineers from the Signal Analysis and Interpretation Laboratory at the University of Southern California, as well as technical guidance and financial support from Google.org, the tech giant's philanthropic arm.

The software, named the Geena Davis Inclusion Quotient, took two years to develop. To date, most analyses of gender in entertainment have required human researchers to watch hours of television or movies, and manually record how frequently and in what context each gender is represented, Narayanan said.

The GD-IQ software rapidly speeds up the process, rolling through a 90-minute

movie in about 15 minutes. It also collects a greater number of data points about which character is seen, which character is heard and what that character is saying. The result, researchers say, is a more nuanced understanding of how gender is represented in media and entertainment.

A study of the top-grossing films of 2015, excluding animated films, found that men received an average 28.5 percent of screen time, compared to 16 percent for women. Even in films where women played a lead role, average screen time was split almost equally between female characters (24 percent) and male characters (22.6). The same wasn't true of movies with male leads.

Data show women were heard even less than they were seen. In the 2015 films studied, women spoke an average 15.4 percent of the time compared to 28.4 percent for men. In films where men and women had co-leading roles, men still received more lines on average than their female co-stars.

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