Gender bias in occupational images on digital media platforms

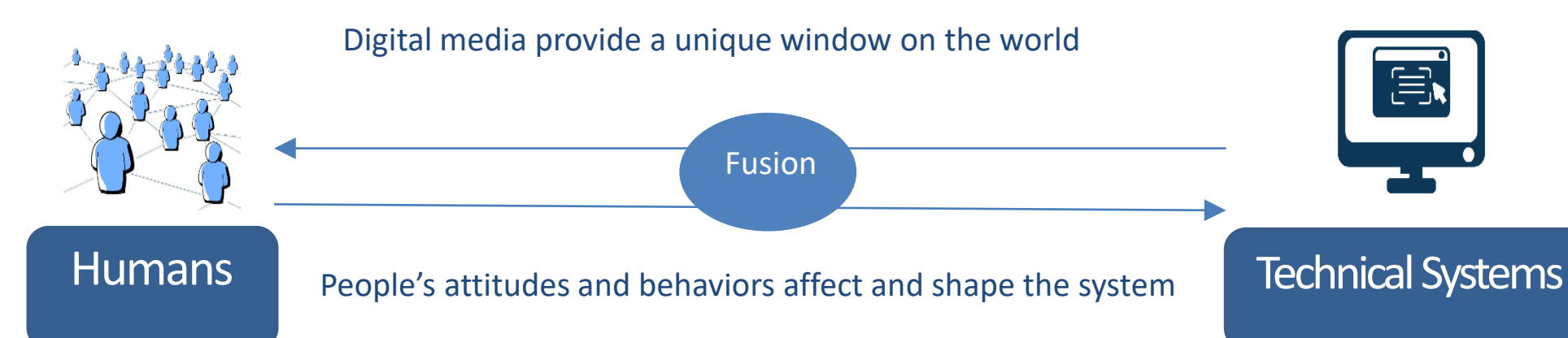## Vivek K. Singh | Mary Chayko | Raj Inamdar | Diana Floegel

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RESEARCH TOPIC

This research is an examination of the extent to which images on four digitally mediated platforms (Twitter, NYTimes.com, Wikipedia, Shutterstock) reflect and shape biases associated with certain occupations (librarian, nurse, computer programmer, civil engineer)

- **Background**
  - Gender bias and stereotyping
    in newspapers and advertisements (de Cabo et al., 2014; Rasul, 2009)
    in social media and search engines (Baily et al., 2013; Ringrose et al., 2013)
  - Sociotechnical systems (Leonardi, 2012; Baym, 2015; Chayko, 2018)

Digital media provide a unique window on the world

Humans — Fusion — Technical Systems

People's attitudes and behaviors affect and shape the system

- **Research questions**
- *RQ1* How different is the image-based representation of highly gender-segregated professions in the physical world compared to digitally mediated spaces and platforms?
- *RQ2* How do the differences vary with time?
- *RQ3* How does the relative ratio of human and algorithmic effort in content creation and curation affect the degree and types of biases observed on different types of digital media platforms?

METHODOLOGY

- **Image collection and organization**
  - All images were downloaded from the Bing image search (API), using query parameters and image filters
  - Relative positions of digital platforms regarding human effort in content creation and curation were determined

TWITTER   WIKIPEDIA   NYTIMES.COM SHUTTERSTOCK

More Amateur   TYPE OF HUMAN EFFORT   More Specialized

More Human Effort — NYTIMES.COM SHUTTERSTOCK WIKIPEDIA
CONTENT CURATION
More Algorithmic Effort — TWITTER

- **Comparison of results with labor statistics**
  - Data corresponding to gender representation in images associated with all four occupations, on each of the four digitally mediated platforms, were compared with U.S. Bureau of Labor Statistics data
  - Magnitude of errors was calculated (giving credit to the challenging of stereotypes)

FINDINGS

In general, online images tend to represent and reinforce traditional gender stereotypes on all four platforms with regard to all four occupations

RQ1
→ Women are largely underrepresented in images on digitally mediated platforms. Platforms with largely amateur contributors (Twitter, Wikipedia) underrepresent women across all the professions examined.

RQ2
→ Trends of gender stereotypes in occupations remained largely consistent over the yearlong period of the project.

RQ3
→ In digitally mediated platforms where the creation and curation of the content is largely automated by algorithm (e.g. Twitter), gender stereotypes and biases are most prevalent, while in those utilizing more direct content curation (e.g. NYTimes.com), trends diverge from the labor statistics and stereotypes are more likely to be challenged.