

Racial Equity, Automation, and the Future of Work

Shannon C. Roberts, Assistant Professor
Mechanical and Industrial Engineering

November 13, 2019



Collaborators at UMass

- Prof. Laurel Smith-Doerr
- Prof. Anna Branch (*Rutgers University*)
- Prof. Henry Renski
- Prof. Shlomo Zilberstein



This project was supported by the National Science Foundation under grant number 1744356. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors/PI and do not necessarily reflect the views of the National Science Foundation.

Overview of the Problem

- Automation will create jobs, eliminate jobs, transform jobs, and introduce new tasks within a job¹
- However, automation only affects certain types of jobs and automation only benefits certain types of people²
- **Jobs that are at high risk of automation have high concentrations of racial minorities³⁻⁵**

Workshop on Automation, Racial Equity, and the Future of Work

- To understand the intersection of automation, racial equity, and the future of work, social and computational scientists must work together
- If social scientists work in isolation, their understanding of the computational science landscape will be minimal
- If computational scientists work in isolation, they may exacerbate existing (racial) inequities

This is similar to the need for industry-university partnerships!



HOW TO
DO
ARTIFICIAL
BRAIN
SCIENCE



ECONOMIC POWER
CONCENTRATED IN A FEW COMPANIES/
PLACES (SILICON VALLEY ROLE)

★ RECRUITMENT as a MOMENT/
CASES for WHEN CAN SEE
PRIVILEGE & PLAN for CRITICAL
CONSCIOUSNESS

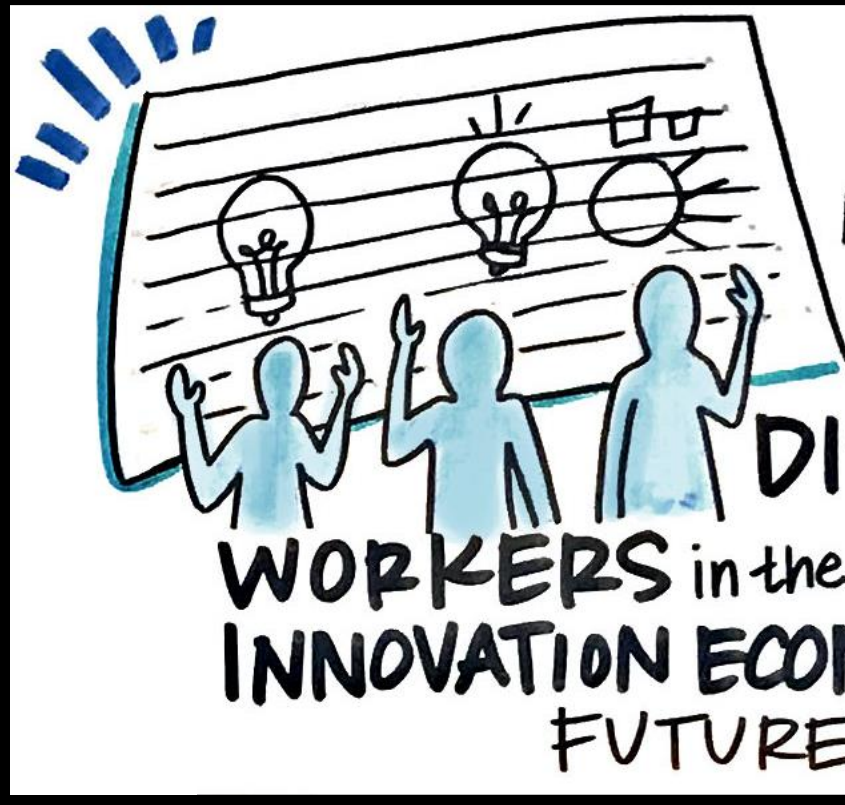
RES

HE
0011 0011
11010001
01110101
10110010
100110
011
10

ADEQUATE. CO
DATA



UNPACK +



NEED to
**ENGAGE
DISPLACED**

WORKERS in the **DESIGN** of the
INNOVATION ECONOMY of the
FUTURE



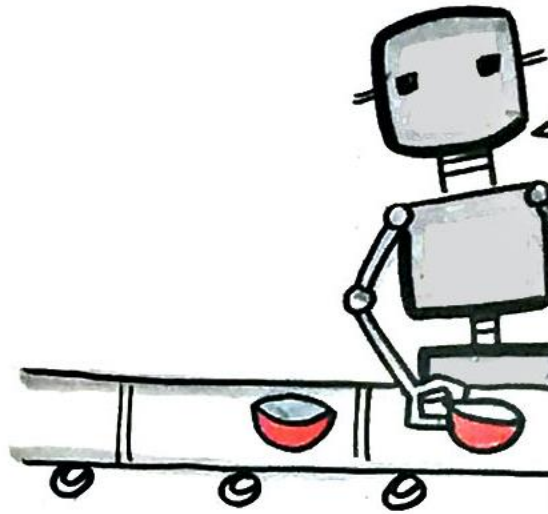
DIFFERENTIAL IMPACT of **PARTIAL**
VS. TOTAL AUTOMATION on **RACIAL**
INEQUALITY

RES

COLLECTIO

11000
01101
DAT

MORE AT
LOCAL
LEVELS



WHICH JOBS
WILL BE
AUTOMATED?

↳ & WHICH WILL
NOT?

WHERE WILL THE JOBS BE LOCATED & WHO
WILL GET THEM?

★ NEXUS
RACE,

★ NEXUS
& ARTIFICIAL INTELLIGENCE

★ WAYS OF UNDERSTANDING
PACE OF ADOPTION OF TECHNOLOGY
IN DIFFERENT AREAS
↳ INTERNAL LOGIC?
↳ COSTS/BENEFITS

LATENT DYSFUNCTIONS
↳ AI

HOW to
**VERIFY and
SUPERVISE
AUTOMATION?**

QUESTIONS



HOW to
**LEVEL the
PLAYING
FIELD**

HOW to SOLVE
for **BIASES**
-EMPLOYERS
-SOCIETY

**TRANSPARENCY, EXPLAINABILITY
and FAIRNESS**

ON?

TECH to ELIMINATE
BIAS in INTERVIEWING



BIAS & DESIGN



RED-LINING,
POLICING

CH GAPS

AL
FLICT/
RMS

STAKEHOLDERS

CAR
PERSONALITIES

DISPLACEMENT
of CERTAIN
GROUPS of
PEOPLE



ENGAGEMENT &
EDUCATION



EXAMPLE:
AGGRESSIVE
DRIVING
STYLE



AUTOMATION

CH AGENDA



FUTURE OF DRIVING AS a WAY to MAKE a LIVING

Potential Industry University Partnerships

Partnerships should focus on:

- Generating explainable automation
- (Re)training of workers
- Consideration of individual differences in the design of automation
- Downstream effects of automation

UMassAmherst
The Commonwealth's Flagship Campus

Acknowledgement and References

Much of this presentation has been published as a book chapter by the workshop organizers, listed in number 2 below.

1. Lee, J. D., & Seppelt, B. D. (2012). Human factors and ergonomics in automation design. In G. Salvendy (Ed.), *Handbook of human factors and ergonomics* (4th ed., pp. 1615–1642). Hoboken, NJ: John Wiley & Sons, Inc.
2. Roberts, S. C., Smith-Doerr, L., Zilberstein, S., Renski, H., Branch, E. H., & Wilkerson, T. (2019). Automation, work, and racial equity: How human systems engineering can shape the future of work. In R. D. Roscoe, E. K. Chiou, & A. R. Wooldridge (Eds.), *Advancing Diversity, Inclusion, and Social Justice through Human Systems Engineering* (pp. 191-214). Boca Raton, FL: CRC Press.
3. Broady, K. (2017). *Race and jobs at high risk to automation*. Washington, DC: Joint Center for Political and Economic Studies.
4. Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280.
5. Muro, M., Liu, S., Whiten, J., & Kulkarni, S. (2017). *Digitalization and the American work-force*. Washington, DC: Brookings Institution.