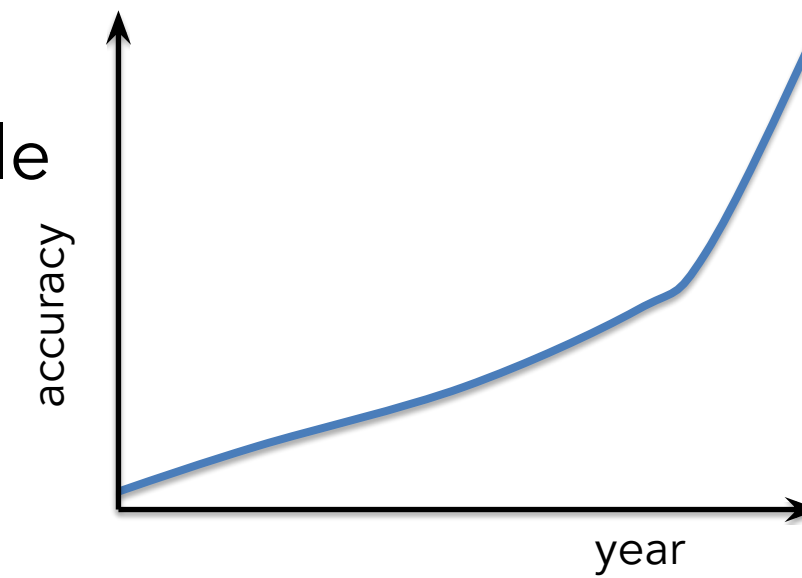


Introduction

Background

Computer vision

- 📷 Tremendous progress in recent years
- 📷 Made previously unsolvable tasks possible
- 📷 Can aid in the development of assistive technologies



Computer vision driven assistive technologies

- 📷 Larger issues regarding the use need to be considered
- 📷 Fairness, bias, privacy, exclusion

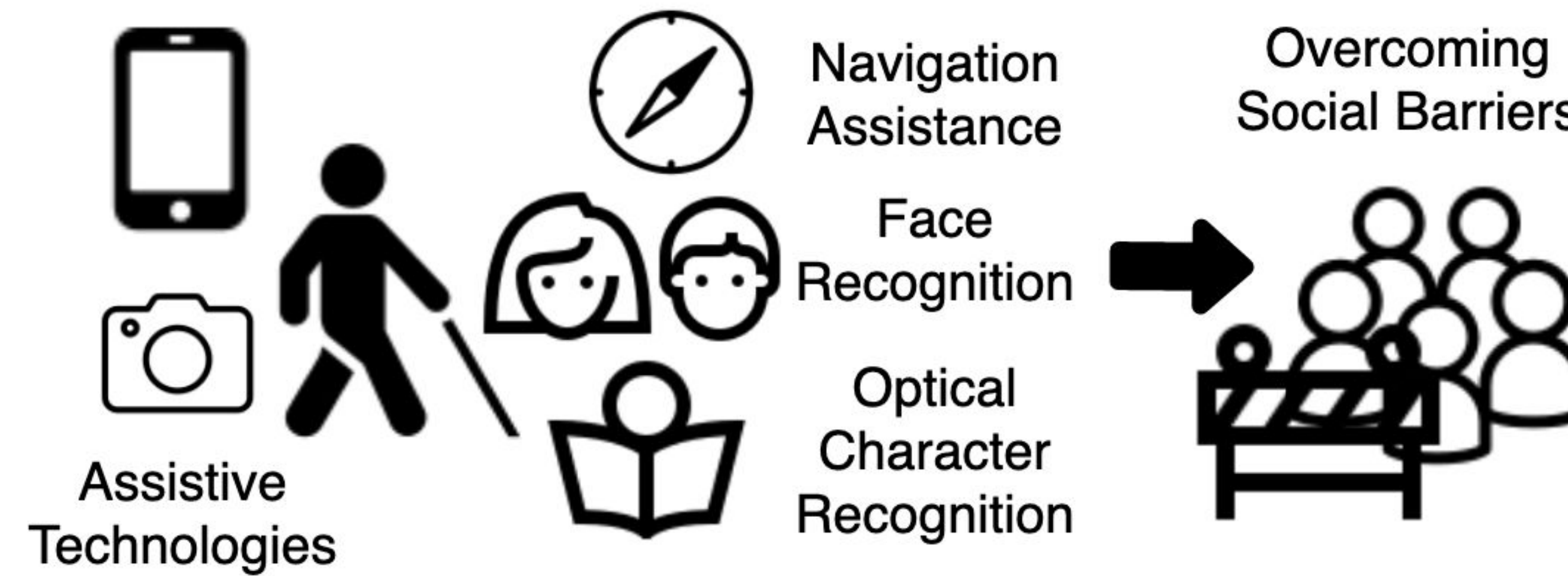
Goal

To address implications computer vision has on assistive technologies for individuals with visual impairment and considerations for computer vision researchers.

- 📷 What are the positive and negative aspects of using computer vision in assistive technologies with respect to the impact on the lives of individuals with visual impairment?
- 📷 What should researchers consider while conducting computer vision research to reduce negative implications of AI-powered assistive technology on the lives of individuals with visual impairment?

Implications

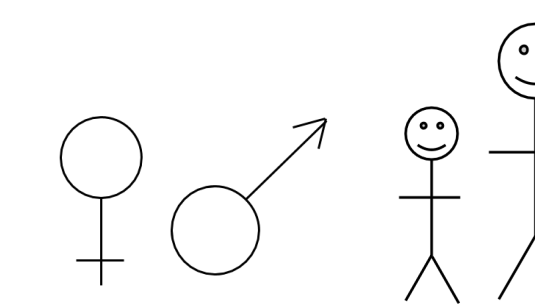
Positive Implications



Negative Implications

Bias results in lower accuracies for...

- 📷 Gender: females than males
- 📷 Race: blacks compared to other race and ethnicities
- 📷 Age: 18 to 30 year olds compared to other age groups



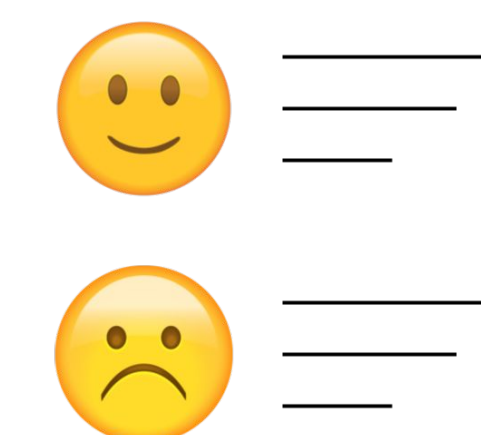
Privacy

- 📷 Exploitation of personal information
- 📷 Obtrusiveness of cameras
- 📷 Tradeoff between autonomy and privacy costs

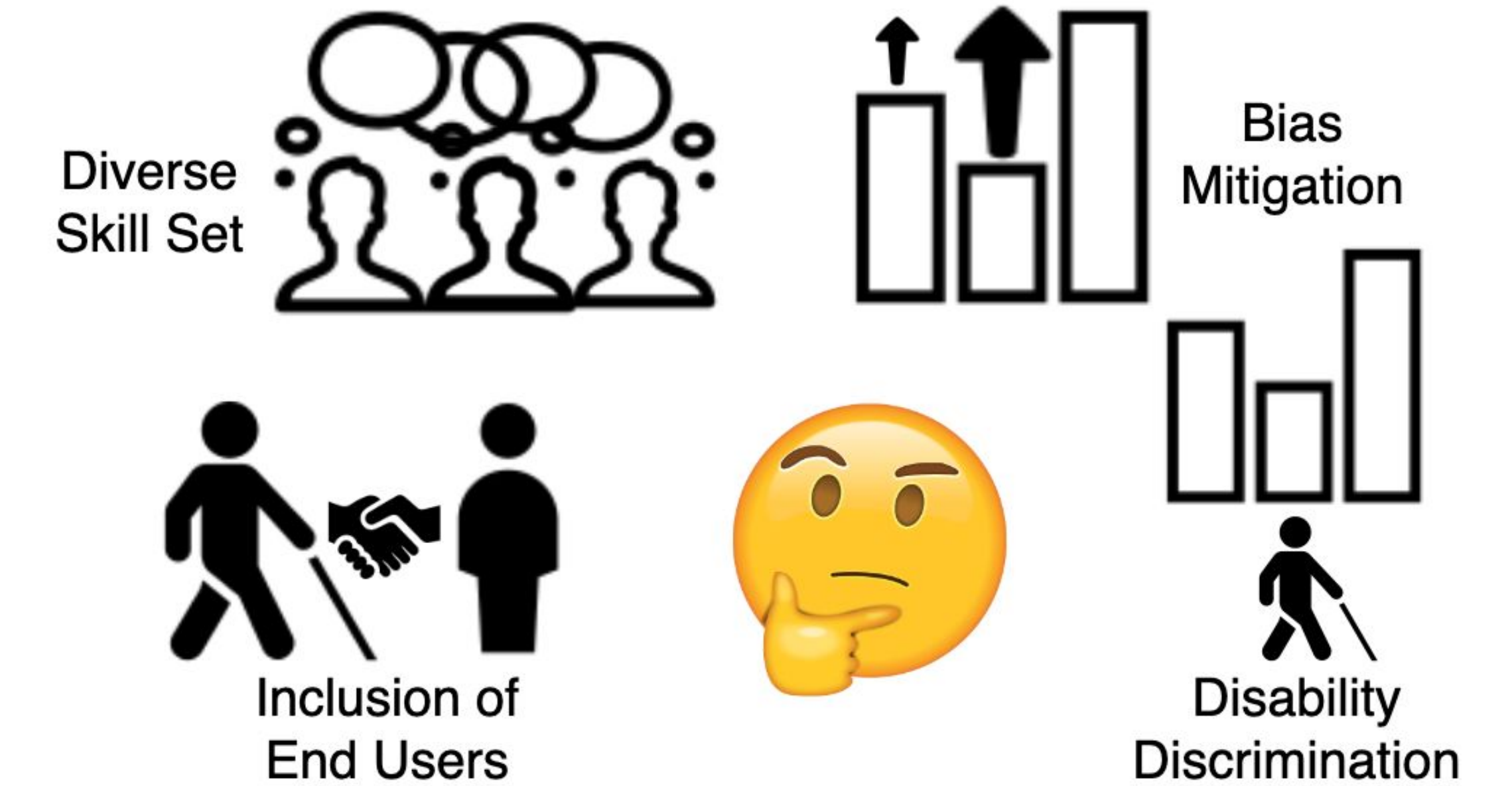


Exclusion in development process

- 📷 Poor device evaluation
- 📷 Age and condition dependent
- 📷 Inefficiency in development process



Design Considerations for Researchers



Bias mitigation

- 📷 Tools to analyze and identify unwanted bias in datasets and ML models.
- 📷 Methods to reduce age, gender and ethnicity bias and bias at the dataset level

Disability discrimination

- 📷 Hasn't been explored
- 📷 Different forms and degrees of disability makes it difficult for a machine learning model to find patterns, form groups and generalize

Inclusion of end users

- 📷 Allow curation of a task specific training set and appropriate model architecture
- 📷 Users are willing to trade-off privacy for more autonomy

Diverse skill set

- 📷 Address biases in datasets and algorithms before commercialized
- 📷 Reduce the chances of data exploitation
- 📷 Understand the needs and goals of individuals with visual impairment