

Exploring the Contextual Influence on Stakeholders' Perception of Human-Robot Collaboration in Construction

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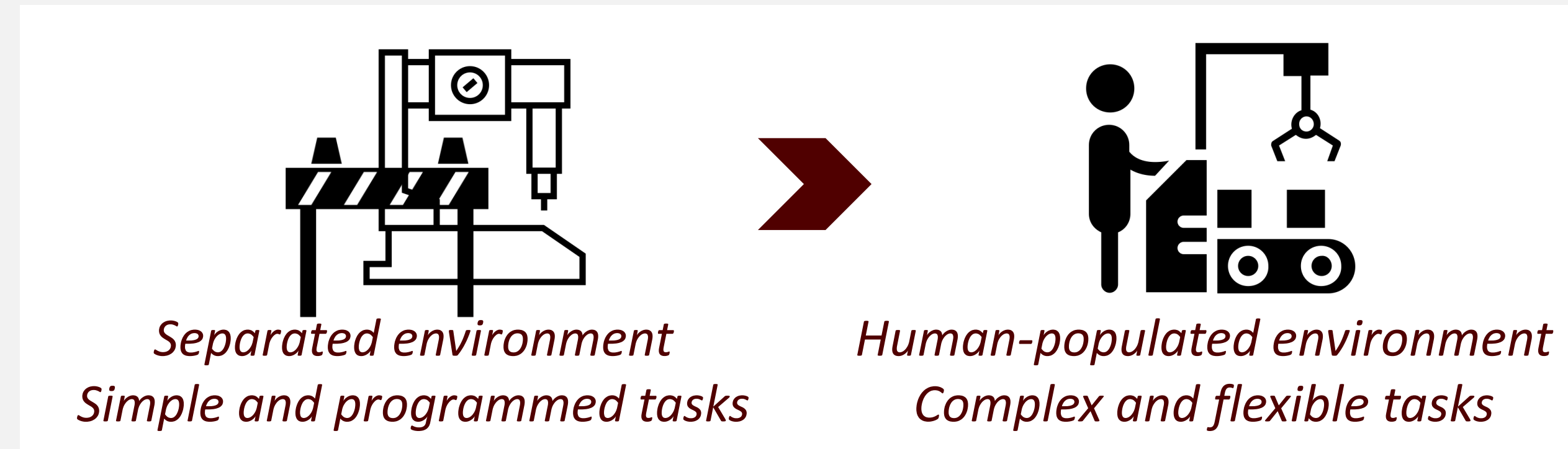
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Introduction

Paradigm shift in robotic technology development

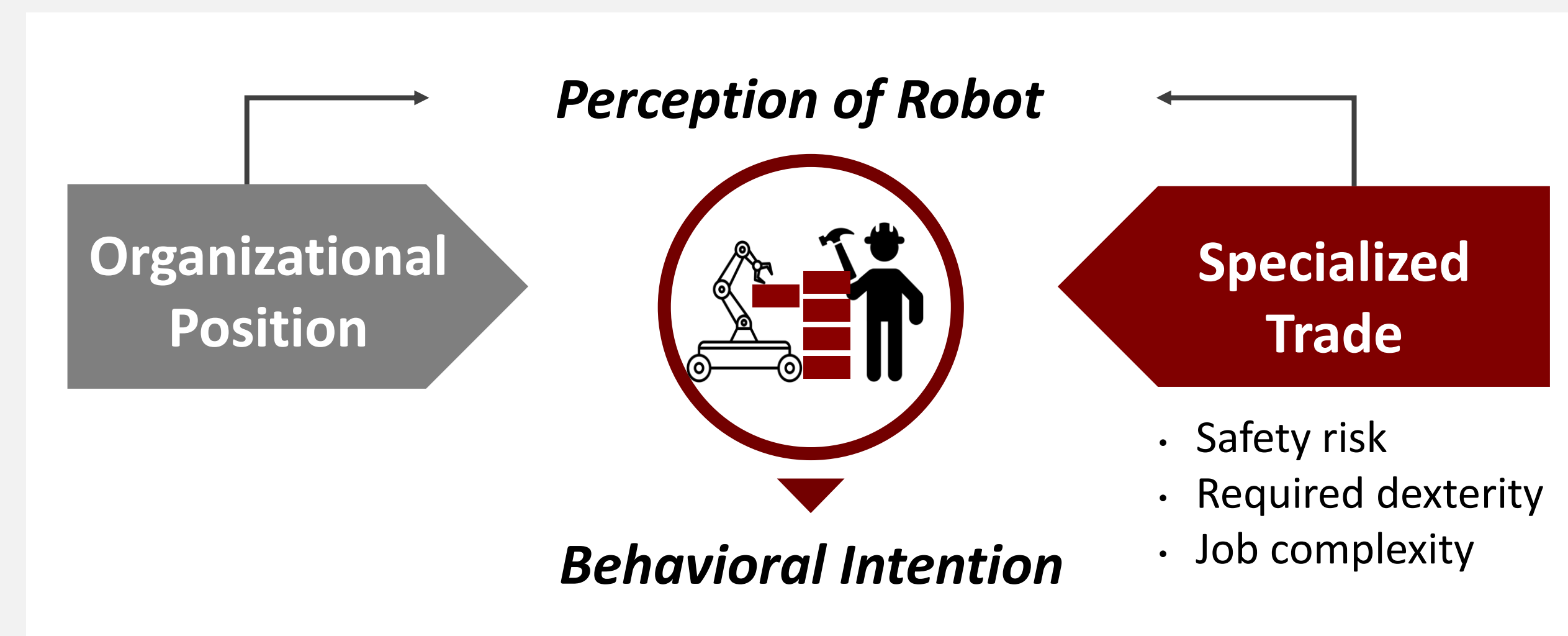
- Emergence of on-site construction robots working alongside/with humans



- Need to understand various users' perceptions of robots to design appropriate HRI for different tasks and situations

Research Objective & Contribution

- To investigate how *the contextual factors* associated with *job positions/related work conditions* shape their perceptions and expectations of construction robots



- Findings can enable organization / developers to *better design future robots* to promote *safe and effective HRI*

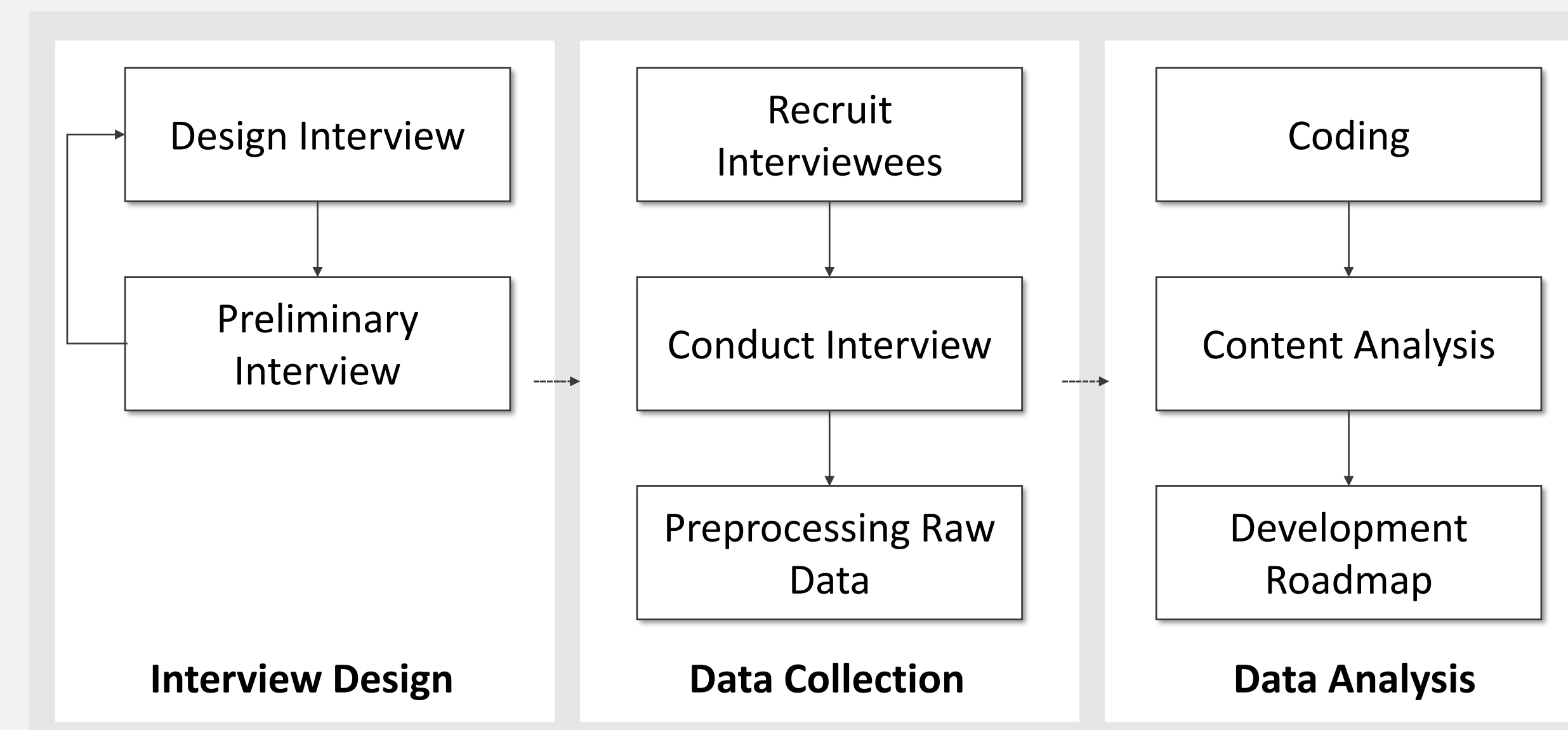
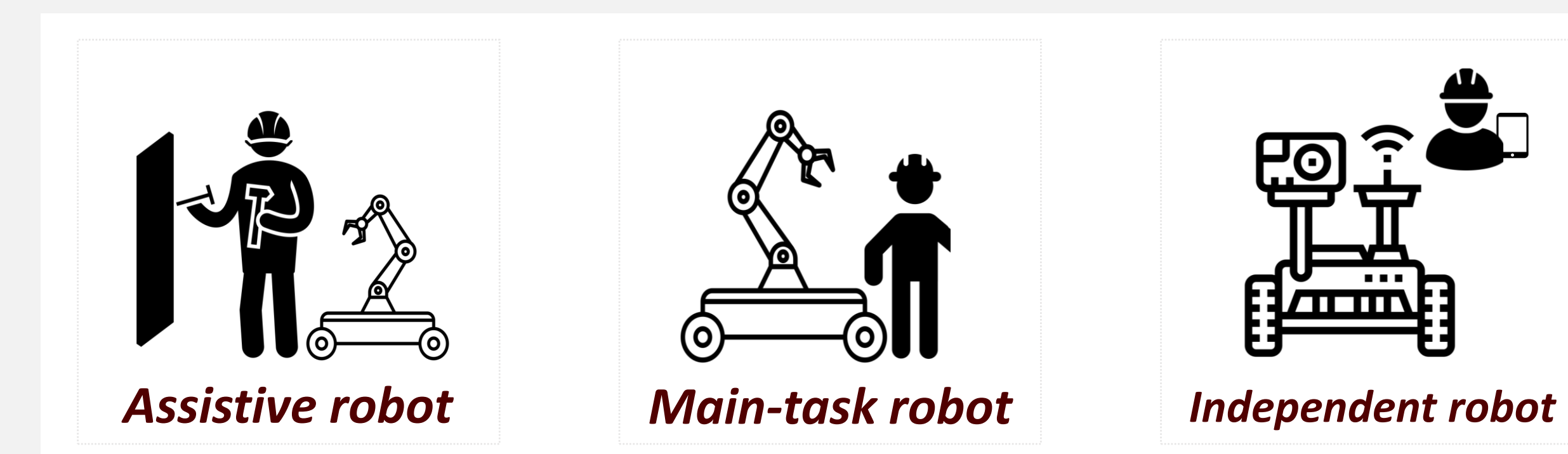
Research Methodology

- Conducted *semi-structured in-depth interviews* (n=36)

Group	Frequency	
	Worker	Manager
General Contractor	-	7
Sub-Contractor	Structural Group	9
	Architectural Finishing	8
Total	36	

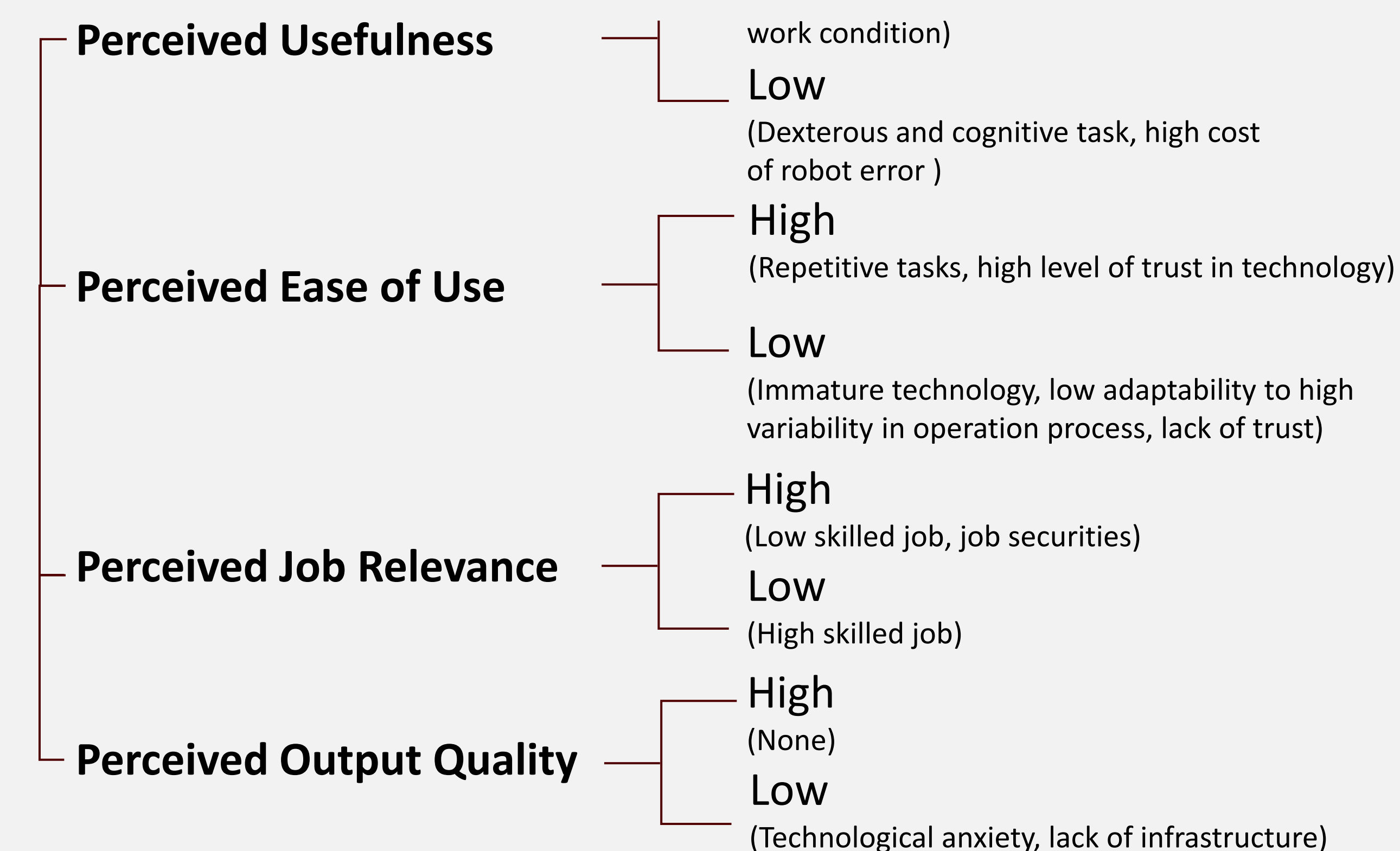
Research Methodology (Con't)

- Participants were asked to *indirectly interact with robots* based on the exemplary videos and photos and illustrated collaborative scenarios based on **level of interaction/control**
 - Independent vs. Collaborative robot
 - Assistive vs. Main task executing robot



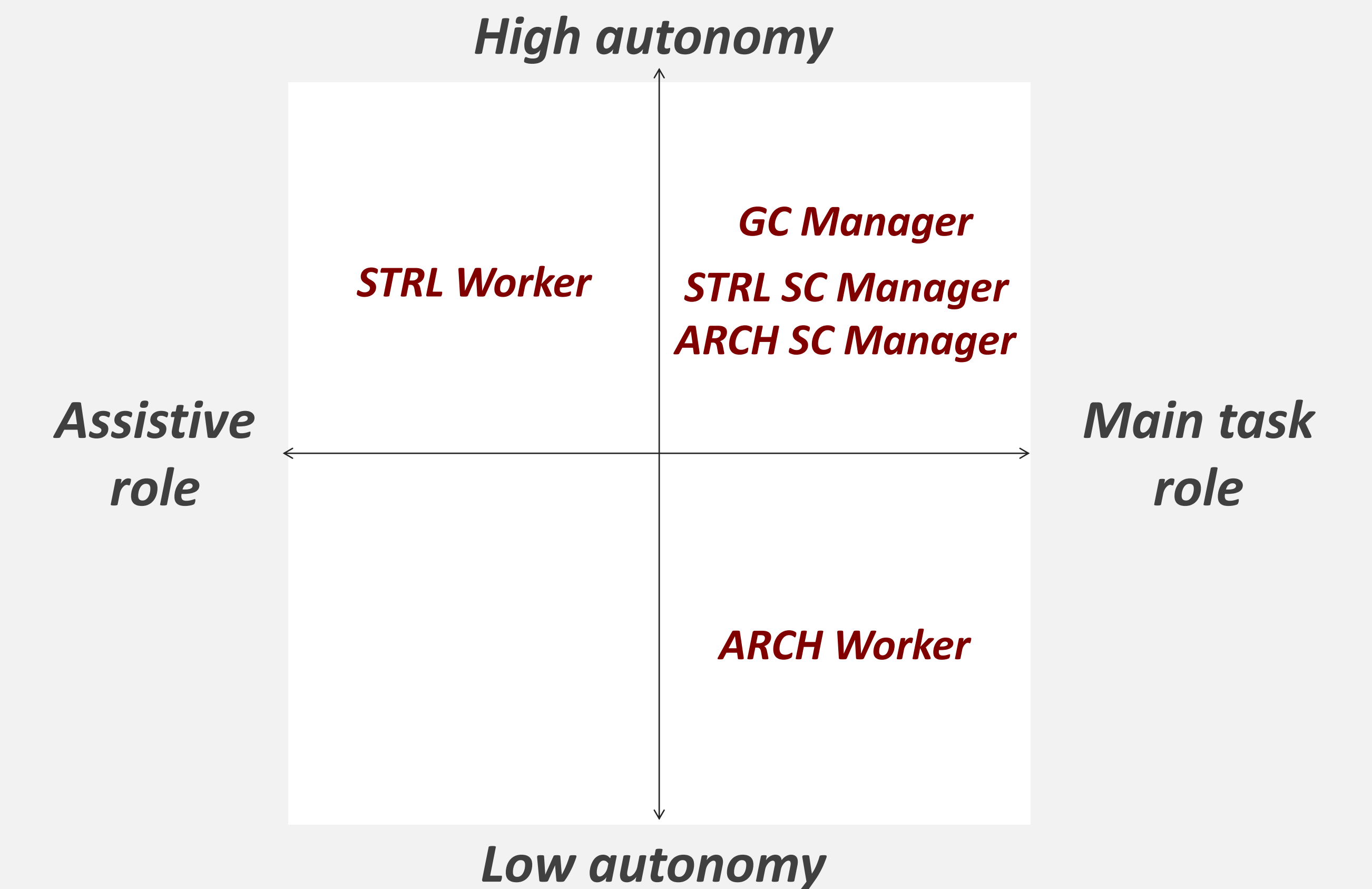
Data Analysis

- Conducted cross-profession and cross-specialization comparison via *qualitative content analysis method*



Result

- Different perceptions among stakeholders' groups in terms of the desired robot role and autonomy level



Discussion

- The presence of robots in the workplace did *not pose significant psychological safety threats* to workers.
- Participants preferred to form *social interaction with robots* and showed *propensity to anthropomorphism* in robot appearance.
- Application for immediate or near-future robot adoptions are *simple sub-tasks with low-level HRI*.

Limitation and Future Work

- *Limitation*: consider only one-to-one human robot interaction; scope of work covers only building project (excluding infrastructure project)
- *Future work*: extend the findings to multi-interactions and further explores the contextual factors

Acknowledgements

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