

# Exploring Non-Verbal Strategies for Initiating an HRI

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## 1. Introduction

The increasing frequency of spontaneous encounter with social robots require to assess user's perception of the robot's intentions beyond the constraints identified for the robot (i.e., proximity)

The question "How does a social HRI begin, and what factors trigger it?" becomes increasingly important and embeds how the nonverbal behaviours of a robot are perceived by a user

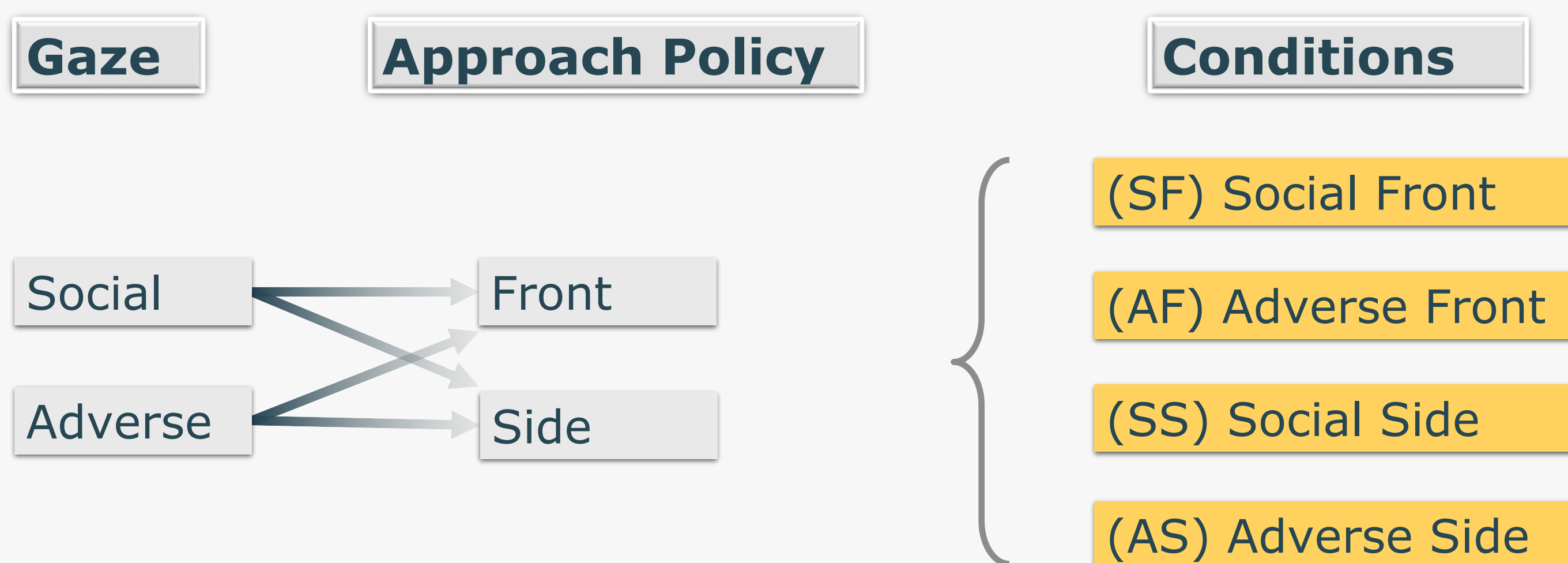
## 2. Methods

Main assumption:

A human and a robot about to start a social HRI continuously exchange social signals in a bidirectional manner that could lead to initiating the interaction

In this work, we investigate the effects of the gaze and approach policy of a robot navigating toward a user in a hall

We recruited 26 participants for a 2x2 experimental design user study with the following conditions:



The robot approached the participant according to the assigned condition and they were instructed to say the keyword "yes" as soon as they could positively answer the question:

**(1) Would the robot like to start an interaction with me?**

A post-interaction survey with 5-point Likert-like scale questions was also submitted to the participants

## 3. Results

Participants responded to (1) the quickest when experimenting the condition (SS) Social Side

In this condition, the robot starts to look toward the participant from far away (4m distance) and they is located on the side (30deg on the right at the end) of the trajectory of the robot

No statistical difference is found in the response time between AF and AS  
From this, we could deduct that:

- the base motion trajectory is less relevant than the gaze direction for eliciting the intention to start a social HRI
- the gaze behaviour is better recognized in an "unnatural approaching"

Here we report the dimensions of the survey whose result show statistical significance namely:

The robot's behaviour is social

The robot would like to interact with me.

I quickly understood when the robot wanted to finish the interaction

(\* for  $p < .05$ , \*\* for  $p < .001$ )

