Proposal HRI

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1 Introduction

Topic: we want to make a robot which helps a user perform some cooking task. The robot helps by reading out loud instructions from a recipe and maybe keeping time for certain tasks, for instance when the pasta needs to be cooked for 8 minutes. The user interacts with the robot via natural speech and the robot reacts through syntesized speech.

Motivation: We wanted to create this robot because the key part of this project will lie in the interaction, which is the topic of this course, there is not a lot of work which is off-topic. It is also a fun project which could help young and old. Letting a robot and a human collaborate together was also interesting to us since it requires many forms of interaction.

Goal: The goal is to at least let the robot and a user perform a simple recipe together, where the robot provides the instructions and the user has to perform them. When that foundation is ready we can implement improvementes: timers, ability to answer open questions (such as, "How long till the pasta is done?") The robot reads a recipe and gives instructions to the user. During this

Target Group: The target group is not entirely clear yet: it could be useful for both the young and old but those groups have some differences. Since it is probably dangerous to let a robot alone with a child for a while it is probably safer to start with building it for the elderly. This is useful for them because it can keep them busy and they might have trouble reading a recipe. Ofcourse the elderly are less able to adjust to mistakes the robot makes.

Risks: There are a number of possible risks and problems during this project. The first risk is having the robot in a possibly hazardous environment during the experiment. In order to conduct this experiment, the participant will have to cook certain recipes together with the robot. This means the robot will have to be placed in a kitchen, which has numerous appliances that could possibly damage the robot. In order to minimize these risks, the robot will not participate in the actual cooking of the recipe. The robot

will be seated on the counter, at a reasonable distance from the participant while the experiment is being conducted.

A second problem might be that the cooking noises during the experiment might disrupt communication between the participant and the robot. The robot might find it hard to interpret the questions asked by the participant, while the participant might have trouble hearing the answers of the robot.

The most obvious and dangerous risk is of course a possible addiction to muffins caused by this experiment. The only real way to solve this is by switching to making pancakes when the participants begin to show signs of addiction.

2   Related Work

Any project which has to implement complex dialogue is related to this project since it is basically just an implementation of a quite complex interaction. (ZIE LITERATURE SHIZZLE voor heel veel citations in die ene paper) (MSS ROLAND CITEREN)

3   Method

To perform dialogue as we intend to several steps have to be made: Understand speech Construct meaningful response Synthesize speech

Understanding speech can be then split up into: constructing words from speech and obtain intent/meaning from the sentence.

So the steps become There are several steps that have to be performed to implement dialogue:

1. Construct words from raw speech

2. Obtain intent and meaning from words

3. Construct meaning full response

4. Synthesize speech

There is a website WIT.AI we can incorporate to handle the first two steps. Synthesizing speech is already there in naomi. Constructing the meaningful response is the hard part of this project and a plan still has to be formed to tackle that problem.

We will test different level of complexities of recipes and research whether the interaction was smooth and if it is preferable to performing the task by yourself.

4   Plan

Team: we will probably use AGILE development and thus we don't know for sure what the schedule will be like. In the first month we will attempt to implement the most basic version of our project and from then on make it more advanced.