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Intelligent Agents
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COVID-19 Planner Agent Design

Agent Architecture

We have decided on a knowledge-based architecture. Since there is no clear goal or further steps requested of the agent, and we built an ontology to base queries knowledge queries around, we considered other types of agent architectures “worse-off”, to solve this task.

Agent Design

The user can state several preferences, some of which could be conflicting, and thus the question the agent must ask is how many of the preferences the agent feels safe to fulfil. For each preference combination, the agent will make a decision through a number of queries, depending on the layers of inference needed to resolve the global query. More layers are needed when the decision depends on multiple relations to resolve before inferring the result.

Internal workings

Sensors: The agent perceives instructions through the classification of information through text recognition into parameters that fit the knowledge base structure, and thus can be inferred upon. The sensor that we currently designed the agent around utilizes a text prompt interface.

Inference Engine: The set of inference rules are defined by joined relations between objects in the knowledge base. The result of the inference will be a recommendation on the chance the situation will lead to COVID spread.

Layers: To answer complex questions, the system may need to extract the result of inferring over sub-questions and then infer over the newly gained knowledge.

Example: “I want to go eat with my friend George and John, regardless of whether it is indoors or outdoors; John always travels without a mask in the train”.

The inference rules would extract that John is a high-risk individual from traveling without a mask in the train as a first layer, then use this knowledge to infer that eating indoors with a high risk person is highly probable to yield COVID spread, while it would infer that eating outdoors with a high risk person would not yield COVID spread. Thus, the agent answer would be that the indoors preference is unable to be fulfilled, but the outdoors preference is.