Corey Crooks
Assignment 3
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Addressing Your Problems:

One problem that I face in the world that could be solved with AI is simply better home automation. Since the revolution of the Internet of Things, smart home devices are showing up left and right. However these devices are only smart enough to some degree and many need other devices linked together to function properly. This huge industry of devices could be much better with the help of AI.

In my house I have many devices, devices ranging from a Nest camera to Amazon's Alexa, Harmony remote, dozens of Hue lights and so forth. The issue with many of these devices is the poor performance of AI integration. The devices use either their own smart hub or work with one universal hub that connects to your home internet allowing you to control from your phone, other devices or your voice. One of the main devices I will focus on in this paper is the amazon echo.

Amazon Echo is a very popular device that is seen within tons of homes throughout the world. The echo is great for giving factual data or even playing your favorite music. The field that the amazon echo lacks is the AI space. The echo is unable to build conversations from previous questions that you had asked it. The echo cannot build relationships with other humans within the house, as in distinctly tell who is speaking to it. The echo is merely a voice recognition device that queries and returns answers from a data source.

The Amazon Echo is a great device for what it can currently achieve however is it even possible for it to be any better? If so, what are the difficulties of achieving a more AI state?
If a new company was starting off building their own device that was being called Echo 2.0 how could they achieve this? The first idea of solving such a problem comes down to using a knowledge representation for capturing a coherent set of events called Scripts.

Scripts, in the concept of the Echo 2.0 would allow the building of one event to another. Using the events in the script, the echo can build a bigger foundation of the topic. The scripts can then be used to generate expectations of what's being asked for or even simply talked about to the device. The device can even build more of a relationship with the human with all of the scripts that are stored in long term memory.

The topic of Understanding plays a very big role with the Echo 2.0 because the devices needs to fundamentally understand what the human is conveying. The device will need to remove and resolve the ambiguity within the world which grammar and constraints would need to be used to guide the interpretation. The concept of Understanding will need to work with frames previously discussed in lectures to build the knowledge base, linking specific frames together.

Another important part of developing Echo 2.0 is common sense reasoning. Common sense reasoning, along with Understanding will also be used hand in hand with Frames. The essential idea is to build the knowledge based framework using frames and then applying more of understanding and common sense reasoning to reduce the ambiguity to allow for more precise and correct results. The device will need to take what is exactly being said, parse the text out into specific frames based on the entire sentence, whether it is a question or a statement. The device also needs to be fast enough to give a response as a normal human would.

Implementing this system comes with many areas that can fail easily. The english language is one of the hardest languages in the world to learn and teaching that to an AI agent is even harder. Sentences can be reworded in many ways for example "Alexa, turn off the lights" or "Alexa, turn the lights off". The first arrangement of words seems as its more of a commanding the device to do something where the second version is more passive. This is another factor that needs to be taken into consideration when developing such device, tonality of the user. The device should be able to change modes based on the users feelings and it should be able to easily recognize them as well.

When creating the device, almost of the topics that we are using in this course would need to be implemented accurately to have a device that acts like a human. Not only those topics but addressing the issues of storage, latency and word processing is critical. Once those are non issues, a solution would be to build a massive knowledge base by frames and to continue building it by a series of learning. Scripts would constantly become introduced to handle different settings and actions and commonsense and analogical reasoning would then be further applied. The system would constantly be fed data to build the knowledge base.

Once a system is built the device could interact with devices all around it to become a more personal system. A system that constantly knows your routine and learns from it with pinpoint accuracy. The system can interact by not only just answering questions but in simple conversation from previous topics. The system can introduce new conversations based on your preferences or from what it detects in your mood. Overall the system would be programmatically smarter than anything ever designed which would take lots of knowledge base structures.