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CS-370 AI

A problem I would like to solve with AI is keeping my house clean. I have several bulging disks in my back, which unfortunately means I am unable to keep my home as tidy as before. I believe this problem could benefit from the application of artificial intelligence, through creation of an AI-powered house cleaning assistant. Throughout this paper, I will describe the problem, propose a solution using AI techniques, identify system components, and address potential ethical concerns associated with my proposed solution.

With busy schedules, children consistently going behind you and making messes after you pick up, as well as physical limitations, maintaining a clean and tidy home is often time-consuming and exhausting. Going to school full time, while also working three part time jobs, and taking care of my family, which includes a husband who is only home a few times a month, three daughters, one of which I home-school, as she has narcolepsy, like me. I find myself being stretched thinner and thinner. This is only complicated more with my back issues, limiting what I can do even when time is not constrained. An AI house cleaning assistant could be beneficial to anyone, but particularly for working parents, the elderly, or individuals with disabilities and/or physical limitations, who find it challenging to complete household chores efficiently.

My proposed solution would be to develop an AI-powered home cleaning assistant, that can autonomously clean and organize a household. The AI would utilize various AI techniques to assist users in maintaining a clean house.

Some of the techniques that would be needed in order to create this assistant, is **computer vision**, as it would allow the system to identify and recognize objects, surfaces, and areas in the home that require cleaning. It could use cameras and sensors to navigate its way through the environment. Another technique is **NLP** (natural language processing), which would enable the system to understand and respond to voice commands and text messages from users. It could be designed to where a user can instruct the assistant to perform specific cleaning tasks, and even offer a schedule for the cleaning sessions.

The next technique would be **machine learning**. This is because machine learning algorithms can be used to adapt the product to understand individual user preferences and allow the system to improve and optimize its routines over time. It could also learn from users’ feedback and adjust accordingly. The next technique would likely be **robotics**. Giving the AI cleaning assistant robotic arms or attachments to aid in performing cleaning tasks, such as mopping, dusting, and vacuuming, will aid in its functionality.

There are several system components needed to create a functional AI-powered home cleaning assistant, which could include the following:

* **Hardware**
  + Cameras
  + Sensors
  + Microphones
  + Speakers
  + Robotic Arms or Cleaning Attachments
* **Data Connectivity**
  + Internet Connectivity for access to online resources such as:
    - Cleaning Instructions
    - Weather Forecast for extra functionality
    - Product Ordering services
* **Cloud Infrastructure**
  + Ability to store and analyze data
  + Perform complex AI Computations
* **Mobile Application or Voice Interface**
* **Data Training Sets**
  + Allowing system to adapt to user preferences
  + Machine Learning algorithms that allow recognition of objects

Though there are many advantages an AI-powered cleaning assistant could offer, there are also ethical concerns to consider when creating any functional AI. The first of these would likely be ensuring all privacy laws were understood and adhered to. Also ensuring data security, and accessibility/usability by those with disabilities is an ethical consideration that should be made. Another ethical concern would be job displacement, as widespread adoption of an AI-powered cleaning assistant could lead to job displacement for employees who hold a position that could now be filled by AI, such as hotel maids, housekeepers, weekly house maid service providers and office building cleaners.

In conclusion, the development of an AI-powered home cleaning assistant could address common problems of maintaining a clean home in today’s ever busying world. Using AI techniques for the system, will allow efficient cleaning and home organization. However, ethical concerns relating to privacy, job displacement, accessibility, and data security must be carefully considered and addressed during the development and deployment stages for this solution.

References/Citations

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