Fuzzy Wuzzy

JCC Service Robot

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Introduction

An important thing to consider when building any project is who to design and build for. Novice engineers would simply build their own project and disregard the customer, even though the customer should be their primary and only focus. When building a service robot, one that serves the masses, it is important to consider who the customer is. For service robots, the customer would be the company that purchases them. The user, however, is the person that needs to use them. Keeping the customer and user happy is equally important when designing the robot. If the user does not like it, the customer may not purchase more or simply return it. If the customer does not like it, they will not purchase it initially. The first design consideration is making the product appealing to the customer. It is amazing if you have a great product, but if there is no one that wants to buy it, it becomes useless. Therefore, making the product as good as possible for the customer is ideal. When it comes to service robots, what is wanted is a robot that does its job helping the target user demographic. In the future, there might be all around service robots, but right now, they are only built to do specific tasks such as guiding people places or fetching objects. Therefore, the most important design consideration is making sure the user is happy with the product and feels helped after using it.

Robot Interface

To make the user satisfied when using the robot, considering how the user might interact with the robot is crucial. There are a variety of different ways that humans can interact with service robots. Among the most prominent of them are vocal commands and some sort of physical interface. Voice commands are most prominent for those who may have issues with interacting with a tablet. An issue with voice commands however is that speech recognition technology has trouble understanding people in loud places. This is an important design consideration when the customer lists where they desire the robot to be located. In a nursing home, this may not be a big issue but in loud business this could mean the robot could misunderstand tasks or cease to function if it cannot hear the user at all. In the future, speech recognition technology could get to the point where it can be used in all types of places and focus on a single person's voice, but right now the technology is not quite there to be used in the service robot industry. Another option is to include a touch screen tablet on the robot. This also has its own tradeoffs that the designer will take into consideration given the customer's requirements. One thing to consider is trying to implement a touch screen with the elderly or those who are disabled in some capacity. They may have a hard time using the tablet so another option may be considered. The final option would be to have some large buttons that can do specific tasks. This limits the number of commands the robot could do but could be good for the elderly who may struggle with speaking or using a modern-day tablet. These three ways to interact with a service robot represent the flexibility and important design considerations the designer must take into consideration to make the customer and user happy with the product. The designer must cater towards the customer and should have open communication with their needs and requirements for the product.

Additional Features

When creating a service robot, it is important to keep on task and ignore potentially useful but ultimately very complex solutions that may not be worth it in the end. One such thing is giving a robot the capability to track people next to it. This could be an important feature when it is an assist robot that is helping people get places, so the robot does not lose them. However, it is important to note that this will most likely not be necessary. The first challenge is to differentiate between a person near them and some other object. If you used something like a depth sensor to assume the object near them is a person, you would run into trouble if a stool suddenly appeared, and the robot got tricked into thinking that was the person instead of the person. For high-end applications, you could have some sort of object recognition system that is constantly running and assuring that the person next to it is the correct person to guide but it is such a hassle for only a novelty. Even then, the program is prone to failing as nothing is truly perfect. Also, the customer most likely does not care about the features, and if they do, you could help guide them to a better and cheaper solution. A solution for example would be to just make the robot go at a slow reasonable pace so no one would struggle to keep up with it. It would go at different speeds depending on where it was deployed - elderly are much slower than people in their 20s. Engineers often struggle with overengineering designs and it is important to stick on task and only build specifically for what is best for the customer and what they actually want.

Considerations for Product Sales

Another design consideration to consider is being able to sell the product. A large concern right now is people's fear of robots. The media has shown how scary AI can be with movies like "Terminator" and "Ex Machina" and it reflects in people's hesitancy to adopt the new technology. In addition, adopting these robots would put people out of work which makes them even more hesitant to support it. A main design challenge in service robots is simply convincing people to use them - which is not a good sign for the industry.

Ethical Considerations

Ethical Dilemmas

Another consideration when designing and creating service robots is the ethical dilemmas at play. Authors of the paper "Service Robots Rising: How Humanoid Robots Influence Service Experiences and Elicit Compensatory Consumer Responses" discuss the potential issues with integrating service robots into our everyday lives. The authors investigated "the underlying process driving these effects, and they find that HSRs elicit greater consumer discomfort (i.e., eeriness and a threat to human identity)" (Mende). People are not currently comfortable with humanoid looking robots taking their jobs and assisting them with tasks as it makes them uncomfortable. Whether this will persist in the future is unknown, but it is certainly a design consideration to be taken into account. The study further remarks that increase the "machinization" of the service robots in lieu of making them more human makes customers feel more at ease (Mende). Thus, when creating a service robot, it should be noted that the actual shape and design of the robot should not only be practical but also make the user feel more at ease given how the populus views service robots in their current form.

Ethical Implications

A final consideration for service robots would be the ethical implications of it all. I have already expressed people's general unease with robots taking over service positions as it would put people out of jobs. This is a current issue with AI in general as people are both wary of the technology and upset that they could lose their livelihood. There are therefore ethical implications to people pursuing this career and creating more robots as they could be putting people out of work. The counter argument to this would be that new technologies have always put people out of work, but then new work arises to fill that gap. The industrial revolution is a great example of this. New technology created a boom where some people lost their old jobs and new ones were created from that. Humans are great at adapting so while there may be growing pains, AI could hold real benefits in the future. In the far future though, if machines were to replace us all, it could be possible that humans would have no need for work. This could be seen as a negative by some who feel like working is their main purpose in life, but people could always keep busy with hobbies and their

passions outside of work. While an AI boom could spell disaster for some, it would most likely be met with some new technology that requires jobs and would fill the void that the lack of service positions left. In fact, the AI boom is already upon us and something that is currently being dealt with. The article "Service robot implementation: a theoretical framework and research agenda" by Daniel Belanche explores the societal implications of service robots and AI in general. He claims that "A survey to business leaders reveal that 24% of US companies are already using AI, and a 60% expect to use it by 2022" (Belanche). AI is already replacing people and Belanche even states "In particular, automated agents increasingly will replace human employees, even in complex, analytical, intuitive, and empathetic tasks" (Belanche). There is no real telling what will happen with the future of AI, but by building more service robots, there is a real possibility of putting hard working people out of work which is something to consider when developing new technologies.

Conclusion

The design considerations and applications of service robots are immense. The first step is to figure out what the customer wants and build the product for them. A secondary consideration is that the user's feedback is crucial in these robots as they are the ones actually using and testing them. How the user interacts with the robot, whether it be with a microphone, tablet, or buttons, are all important to consider when designing a service robot. It is important to stay on task and not create unnecessary features that do not directly affect the end product. Lastly, the ethics of building a robot should be taken into account as they are currently threatening the livelihood of many people's careers.

References

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