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The Benefits of Robotics In Today's Society

It is no question that the integration of robots into society has already begun, of course not as the common troupe one might see as in the popular post-apocalyptic movie i-Robot (at least not yet!). No, we are not there yet but the current robotics available today and the numerous positive benefits they provide do give us an insight as to by how much advancements in robotics can benefit humanity and it is quite interesting. In this 'lit review' I will discuss two key examples of robotics and the benefits made from recent advancements in arm packing robots and a literal arm prosthesis.

A key challenge in robotics of course is the difficulty of correctly programming the technology to either help handle human labor tasks (object manipulation) or in the more extreme case that will be discussed handle human ***bodily*** tasks (nervous system integration). To further emphasize the problem of the former topic, solving the packing problem might seem trivial to us sentient beings with the benefit of common sense, but to robots involves satisfying many constraints. For example assessing which heavy objects to not be placed on top of lighter ones and not over stacking suitcases to avoid its collapse.

Traditional methods involve guessing partial solutions that meet a single constraint at a time then assessing if a previous one was violated. While effective to an extent, this sequential approach is far from optimal. Recent advancements made by MIT researchers have taken the AI approach and now are using generative AI models which were dubbed a 'diffusion model' that are trained to represent a specific type of constraint. Using this concept, models can be combined to create a 'global solution' to the packing problem. What exactly is the approach you might ask? The approach takes into account all constraints at once greatly reducing the efficiency of the task compared to the sequential solution.

The latter topic covers a different type of robotic arm, the prosthetic arm. Fifty years ago a popular TV series by the name of "The Six Million Dollar Man" promoted a futuristic world full of advanced bionics that would change with the world as we know it all summarized with the iconic phrase: "We can rebuild him, we have the technology." This is now finally coming into fruition in the year 2023 and the world has to thank Sweden in large part for it. A Swedish woman that goes by "Karin" had a life-changing experience in which she lost her right hand in a farming accident over 20 years ago. In 2017, she was outfitted with a bionic appendage that is considered a 'first-of-its-kind' groundbreaking technology. The result was a dramatic improvement in bodily function and a significant reduction in the pain she experienced previously.

The current open research question for bionics is the consistent poor control of these prosthetic devices. However with recent advancements made with Karin and the first-of-its-kind bionic she was outfitted with, hopes are high that the results remain problem to put an end to this concern. Indeed, robotics plays an integral part in the advancement of human civilization.

Works Cited

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