Perspective
Volume 11:5, 2022

Advances in Robotics & Automation

ISSN: 2168-9695

Open Access

Characterization and Applications of Biological Robotics

Rakesh Kumar*

Department of Economics, Indian Institute of Technology, Delhi, India

Introduction

Robots have long captivated the imaginations of people from all walks of life, and they have made significant advances in the fields of innovation and design. However, the latest trends in robotics have been heavily influenced by the world of biology. This has aided in the transformation of natural world knowledge to solve a variety of engineering problems. Biologically based robots have assisted scientists and engineers in developing novel methods and techniques for creating specialised robots. Many biologically-based robots have been used in the healthcare sector to develop new treatments and external aids for a variety of healthcare-related issues [1].

Description

Soft robots are robots that are based on the adaptability of living organisms. They provide greater versatility and can be used in medical and rescue operations. Such robots could be used to build Exosuits for increasing physical strength or even in invasive surgeries. Example for functionality, powered leg orthoses powered by ECG has been developed alongside prosthetic hands and arms.

Biologically based robots have come a long way since their invention and continue to make strides in the field as a result of adopting various environment-based natural activities and implementing them through various means. Bio-inspired robots have a wide range of applications, from industrial to advanced space missions. This demonstrates the importance of biology in the technological world [2].

Biologically inspired robotics is distinguished by a multidisciplinary approach aimed at improving collaboration between roboticists and biologists. The IEEE Robotics and Automation Society (RAS) Technical Committee (TC) on Biorobotics was established to provide a forum and dissemination mechanism for the interaction of biological and artificial (autonomous or semiautonomous) systems, as well as to present biology as a learning tool for novel engineering paradigms [3]. Thus, the scope of biorobotics research encompasses major approaches like the application of biological concepts/ strategies to improve the current capabilities of robots, such as extending the robot's flexibility and robustness by adopting design principles of biological systems, and the application of advanced robotic technology to improve the current techniques/methodologies used by biologists.

In the human body, nanorobot-like red blood cells are exposed to human body fluids and undergo numerous physicochemical changes, while these nanorobots (fullerene structure coated haemoglobin embedded iron inorganic elements) remain safe and kill bacteria or viruses. This lethal action is proposed as a 'nanorobot driven nanomedical treatment' to combat a bacterial or viral infection [4]. Because of their oxygen binding properties, red blood cells can also be used as imaging agents. Based on their behaviour in nanomagnetic fields, our experiments focused on the application of nanorobots (red cells) to make them immune resistant to viruses and useful contrast agents in magnetic resonance imaging.

It entails injecting a few cubic centimetres of nano-sized nanorobots suspended in a specific pH fluid (likely a water/saline suspension). The typical therapeutic concentration was up to 1-10 trillion (1 trillion=10 raised to power 12) individual nanorobots, though in some cases treatment only required a few million or billion individual nanodevice-like red cells to be injected. Each nanorobot cell was on the order of 0.2 microns to 0.3 microns in diameter, similar to an artificial mechanical red cell floating through the bloodstream. Nanorobots designed to travel through the bloodstream to their destination will most likely be 500-3000 nanometers in size [5].

Conclusion

The new 'passive diamond exteriors' technology may be ideal for making immunoresistant nanorobot red cells against opsonization. Because nanorobot red cells generate energy by metabolising local glucose and oxygen, they could be used as contrast agents in 13C-MRI, ultrasound imaging and physiological or fMRI. We believe that travelling nanorobot carrier cells containing nanocomputer CPUs capable of performing 10 teraflops (10 raise to the power 13 floating-point operations per second) as nanomedicine robot devices are within reach. In medical applications, nanorobot red cells coated with diamond or diamondoid/fullerene nanocomposites in the presence of inorganic elements such as hydrogen, sulphur, oxygen, nitrogen, fluorine, silicon, and others may be used for special purposes in nanoscale gears.

References

1. Morone, G. "Robots for stroke rehabilitation: Not all that glitters is gold." *Funct Neurol* 34 (2019): 5-6.
2. Kok, Bing Cai, and Harold Soh. "Trust in Robots: Challenges and Opportunities." *Curr Robot Rep* 1 (2020): 297-309.
3. Laut, Jeffrey, Maurizio Porfiri, and Preeti Raghavan. "The present and future of robotic technology in rehabilitation." *Curr Phys Med Rehabil Rep* 4 (2016): 312-319.
4. Maccioni, Giovanni, Selene Ruscitto, Rosario Alfio Gulino, and Daniele Giansanti. "Opportunities and problems of the consensus conferences in the care robotics." *Healthcare* 9 (2021): 1624.
5. Choi, Hanna, and Gyeonghui Jeong. "Characteristics of the measurement tools for assessing health information-seeking behaviors in nationally representative surveys: Systematic review." *J Med Internet Res* 23 (2021): e27539.

***Address for Correspondence:** Rakesh Kumar, Department of Economics, Indian Institute of Technology, Delhi, India, E-mail: rakeshkumar@gmail.com*

Received: 05 May, 2022, Manuscript No: ara-22-66671; **Editor assigned:** 07 May, 2022, PreQC No: P-66671; **Reviewed:** 10 May, 2022, QC No: Q-66671; **Revised:** 15 May, 2022, Manuscript No: R-66671; **Published:** 20 May, 2022, DOI: 10.37421/2168-9695.2022.11.213

How to cite this article: Kumar, Rakesh. "Characterization and Applications of Biological Robotics." Adv Robot Autom 11 (2022): 213.