

Extensible Continuum Manipulator

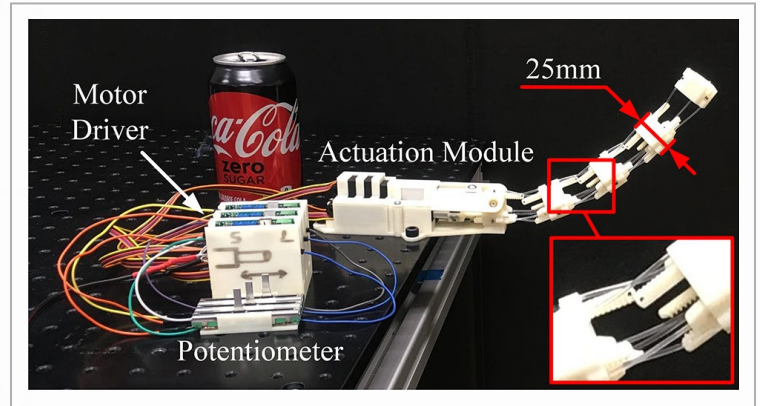
VTIP 20-083: “Novel Extensible Continuum Manipulator”

THE CHALLENGE

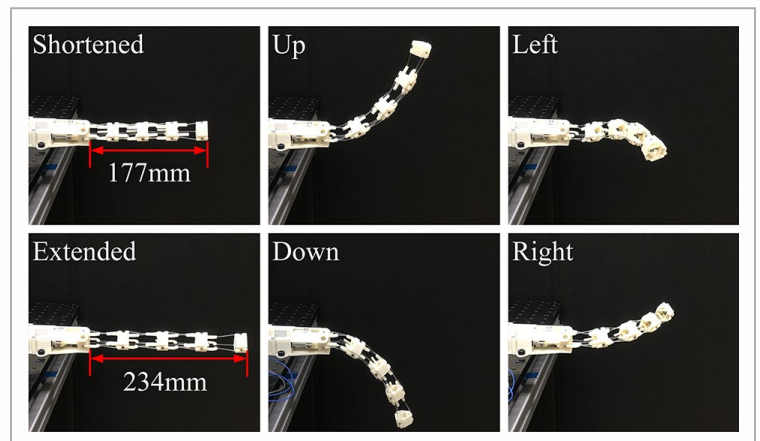
The current generation of continuum manipulators are used across multiple industries – medical, security, and manufacturing – but these current designs face notable limits due to the lack of the extension or longitudinal degree of freedom. For instance, many medical robotics are unable to reach some targeted locations because of this shortcoming. Additionally, many manipulators have very large actuator setups significantly limiting their mobility. If robots are to be used to their fullest potential, an improved generation of continuum manipulators is needed.

OUR SOLUTION

Pinhas Ben-Tzvi and his team have developed the first “extensible” continuum manipulator which is modular, scalable, maneuverable, and extrinsic-actuated. These features allow the device to be easily serviced and operated on while also facilitating utilization in previously unattainable applications. The extendable nature increases the manipulator spatial mobility and degrees of freedom, and the workspace size of the continuum manipulator combined with the modular nature of the design allow for easy upgrades based on device usage and consumer needs. While this was developed in the meso-scale, the continuum manipulator could easily be scaled up or down depending upon the desired application.



Proof-of-concept prototype of the new extensible continuum manipulator with a soda can for scale. The actuation module is much smaller than other similar manipulators making this design far more versatile than others available on the market.



Demonstration of the manipulator’s extensibility and flexibility.



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