Continuum robot trunks and tentacles

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Abstract

This talk will provide an overview of research in biologically inspired continuous backbone "trunk and tentacle" continuum robots. Continuum robots are an emerging form of robot structure, featuring smooth backbones. These structures can be formed using a variety of materials and actuation techniques. Often inspired by structures in biology including the trunks of elephants and the arms of octopuses, these robots are inherently compliant. This allows them to adapt to their environments and to penetrate congested spaces where traditional robots cannot. Continuum robots have found application in a variety of medical procedures. However, their modeling, sensing and control present novel, interesting and significant challenges. In the talk, continuum robots inspired by octopus arms and plants (vines) will be discussed. Use of these robots for novel inspection and manipulation operations, targeted towards Space-based operations, will be discussed.

Biography

Ian D Walker received BSc in Mathematics from the University of Hull, England, in 1983 and the MS and PhD in Electrical and Computer Engineering from the University of Texas at Austin in 1985 and 1989. He is a Professor in the Department of Electrical and Computer Engineering at Clemson University. His research focuses on research in the construction, modeling and application of continuum robots. He is a Fellow of the IEEE and a Senior Member of the AIAA. He has served as Vice President for Financial Activities for the IEEE Robotics and Automation Society and as Chair of the AIAA Technical Committee on Space Automation and Robotics. He has also served on the Editorial Boards of the *IEEE Transactions on Robotics, the IEEE Transactions on Robotics and Automation, the International Journal of Robotics and Automation, the IEEE Robotics and Automation Magazine.*

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