Docket #: S14-387

Position/force control of a flexible robot under model-less control

Stanford researchers in the Camarillo Lab have patented a model-less, robotic position-control technique that regulates force. The controller simultaneously controls position and applied forces of the manipulator as it moves through a workspace, without requiring a model. In addition, the robot traces paths along the environment while a specified amount of force is maintained and not exceeded. This model-less control technique is ideal for medical robotics where small, flexible devices navigate constrained and highly sensitive environments.

Stage of development - Prototype

Applications

- **Flexible robotics**
- **Medical robotics**
    - Catheters
    - Endoscopes

Advantages

- Accurate – especially in constrained spaces
- Constant – maintains safe levels of constant contact
- Adaptive - navigates irregular and unpredictable constrained spaces

Publications

- Yip, Michael C., and David B. Camarillo. "Position/force control of a flexible manipulator under model-less control." U.S. Patent 10,434,644, issued October 8, 2019.
- Yip, Michael C., and David B. Camarillo. "Model-less Feedback Control of Continuum Manipulators in Constrained Environments." IEEE Transactions on Robotics. 30, no. 4 (2014): 880-889. DOI: 10.1109/TRO.2014.2309194

Patents

- Published Application: WO2016073367
- Published Application: 20170312920
- Issued: 10,434,644 (USA)

Innovators

- Michael Yip
- David Camarillo

Licensing Contact

Evan Elder

Associate Director, Licensing and Strategic Alliances, Physica

Email