# Surgical Manipulator with Finer Motion Control and Capability

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## Technology description

Minimally invasive surgeries – including robotic procedures – utilize manipulators, which are inserted into patients to help maneuver tissue or tools. Manipulators can be classified either as rigid-link or flexible continuum devices. Flexible manipulators (such as catheters) often are desirable because they are softer and less likely to damage tissue. For this reason they are popular when safety is paramount, such as intracardiac and vascular interventions.

On the other hand, flexibility has drawbacks. Soft compliant structures, in combination with internal friction, can be difficult to position and operate. A UW–Madison researcher has developed a new device, called an interleaved continuum-rigid manipulator, that combines safety and high performance. The device is made of flexible segments interleaved with small, rigid-link joints. The segments elastically flex upon insertion into tissue, and are designed for tendon-driven articulation and telescoping motion. The rigid joints serve as limited stroke actuators to move and control the flexible segments.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a new manipulator device that combines flexible and rigid components.

## Application area

Minimally invasive surgical procedures, such as valve replacement, stem cell injection, ablation and atrial fibrillation

## Advantages

Enhances motion capability and control
Larger-scale flexibility
Actively corrects motion errors
Enables accurate tool positioning and dexterity

Institution

Wisconsin Alumni Research Foundation

Inventors

Michael Zinn