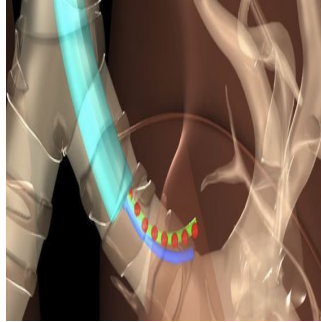

Researchers Devise X-ray Approach to Track Surgical Devices



Researchers from North Carolina State University and the University of North Carolina at Chapel Hill (UNC) have developed a computer program to help surgeons use X-rays to track devices used in minimally invasive surgical procedures, which also limits the patient's exposure to radiation from the X-rays.

The new tool is a computer program that allows surgeons to enter what type of procedure they'll be performing and how precise they need the location data to be. Those variables are then plugged into the algorithm developed by the research team, which tells the surgeon how many X-rays will be needed – and from which angles – to produce the necessary location details.

For example, if a surgeon needs only a fairly general idea of where a device is located, only two or three X-rays may be needed – whereas more X-rays would be required if the surgeon needs extremely precise location data.

"We have now developed an algorithm to determine the fewest number of X-rays that need to be taken, as well as what angles they need to be taken from, in order to give surgeons the information they need on a surgical device's location in the body," said Dr. Edgar Lobaton, an assistant professor of electrical and computer engineering at NC State and lead author of a paper on the research.

The paper, "Continuous Shape Estimation of Continuum Robots Using X-ray Images," will be presented at the IEEE International Conference on Robotics and Automation, being held in Karlsruhe, Germany, May 6-10. The paper was co-authored by Jingua Fu, a former graduate student at UNC; Luis Torres, a Ph.D. student at UNC; and Dr. Ron Alterovitz, an assistant professor of computer science at UNC. The research was supported by the National Science Foundation and the National Institutes of Health.

Image credit: Edgar Lobaton

This graphic illustrates a surgical tool in a human lung. The blue curve corresponds to what we expect the device to do. The green curve represents what would happen in a real procedure were some perturbations introduced. The red-dots represent the estimated shape based on where the new x-ray algorithm says the surgical tool actually is.

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