

IIT Kharagpur partners with Intuitive Foundation to explore use of AI-enabled surgical models

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To create structured digital models of surgery that map surgical decisions



Indian Institute of Technology (IIT) Kharagpur has announced a new research programme in partnership with Intuitive Foundation, a non-profit organisation funded by Intuitive Surgical, a global technology leader in minimally invasive care and the pioneer of robotic-assisted surgery.

The initiative aims to develop comprehensive digital models of surgical care that can underpin more reliable safety guidance, AI-enabled decision support, and responsible early-stage automation in future robotic-assisted procedures. Over time, these advancements are expected to help surgeons work with greater confidence and consistency, supporting better patient outcomes through more standardised and predictable surgical processes.

To test these models, IIT Kharagpur will use the da Vinci Research Kit (dVRK), a non-clinical research platform built from retired da Vinci systems. The dVRK links digital models to physical robotic movements, enabling the development and testing of early automation modules using phantoms, synthetic tissues, and anatomical models. All testing will take place in controlled laboratory settings and will not involve human surgery.

The work is guided by a multidisciplinary research team and supported by IIT Kharagpur's long-standing collaboration with Nil Ratan Sircar Medical College and Hospital in Kolkata. By closely documenting cholecystectomy procedures (the surgical

removal of the gallbladder) in real clinical settings, the researchers will gain practical insight into how surgeries unfold, helping them refine the digital models and identify where supportive tools could have the greatest impact.

The programme is expected to deliver two major outcomes. The first is a complete digital footprint of the surgical pathway, enabling AI-driven systems that combine diagnostic details, planned scenarios, intra-operative context, and recovery data to highlight safer techniques, flag deviations, and trace the sources of complications.

The second is the responsible introduction of selective automation. Once the mapped workflows identify steps that are simpler, safer, and more repeatable, targeted automation modules can support surgeons during routine tasks and help them focus on higher-level decision-making.