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The Valhalla Tool: “A modified laparoscopic instrument with wireless
digital motion sensors” IPEG 2009

VALHALLA, second iteration

Takes our prior art further by facilitating:

- Assessment of Gestural Surgical Trainee Performance (GSTP, 2010) using Game Theory
- User Interaction
  i. branching scenarios
  ii. timers to measure confidence intervals in scenarios
  iii. precision hit targets with pre and post conditional states
  iv. replay modes for reviewing, eliciting ghost modes for re-instruction by seniors.
- Sensors attached to existing laparoscopic tools (patented and reported in IPEG 2009), completely tether less, that mimic 3D mouse motion technology as a high resolution input for interacting in a 3D environment.
- Since we are using existing laparoscopic tools, we make use of existing plastics laparoscopic trainer boxes, cheap haptics feedback – no need for expensive computer sensory haptics.
- Full gesture recording of orientation and positional data collected on trainee surgeon’s performance in simulation, with transposition of plastics-world entity into virtual simulated environment.
- Game theory assists in providing analytical methods on charting a trainee’s improvement in practicing with scenarios.
- High sensitivity in motion capture reflecting delicate precision in motion control – considers trainee needs
  i. Basic to advanced laparoscopic procedures and skills
  ii. Camera driving
  iii. Hands-on skills training
  iv. Psychomotor skills
  v. Hand-eye coordination
  vi. Depth perception