GHOST (Guidance Help for Operating Surgical Trainees)

Piattaforma basata su Realtà Virtuale per il Telementoring in Laparoscopia

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La Medicina Incontra la Realtà Virtuale

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Outline of the talk

- The Scientific Problem
- What is Telementoring?
- GHOST
- Conclusions
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“To Err is Human” by Institute of Medicine (1999), estimating that between 44,000 and 98,000 patients die annually in the United States as a direct result of medical error.

Over half of all medical adverse events are surgical in nature and 75% of these happen in the operating room.

Many of them may be errors caused by physicians in the process of the “learning curve”.

Aldrich C.
Learning Online with Games, Simulations, and Virtual Worlds: Strategies for Online Instruction (2009)
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What is Telementoring?

Technological background

Telemedicine, based on videoconferencing technologies, has been used in different medical specialties to provide medical consultation to patients in remote areas.

Definition

Real-time interactive teaching of techniques by an expert surgeon (mentor) to a surgeon (mentee) not at the same site, represents a more advanced telemedical application as it delivers care, besides educating.

(by SAGES, The Society of American Gastrointestinal and Endoscopic Surgeons)

What can telementoring do?

When was telementoring born?

Telementoring traces its roots to 1959 when a telemedicine network for the clinical continuing medical education was established at University of Nebraska.
What is Telementoring?

### Clinical evidence


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What is Telementoring?


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Mentor Station

Mentee Station

EndoCAS – University of Pisa, Italy
Data Exchange

Data Stream

Mentor Station

Mentee Station

Video Stream
Mixed reality

Virtual camera position and virtual projection model have to be identical to the real ones.
- Automatic calibration for the camera projection model

- Virtual camera positioning
  - Manual positioning using an ad-hoc interface driving the 4 DOF of the laparoscope (integrated).
  - Automatic registration of the camera (under development).
Camera Automatic Localization

Source

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- The Scientific Problem
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Presentation of the Scientific Problem
Definition, capabilities, and clinical evidence of telementoring
Description of GHOST platform