NRI: FND: Customizable Haptic Co-Robots For Training Emergency Surgical Procedures

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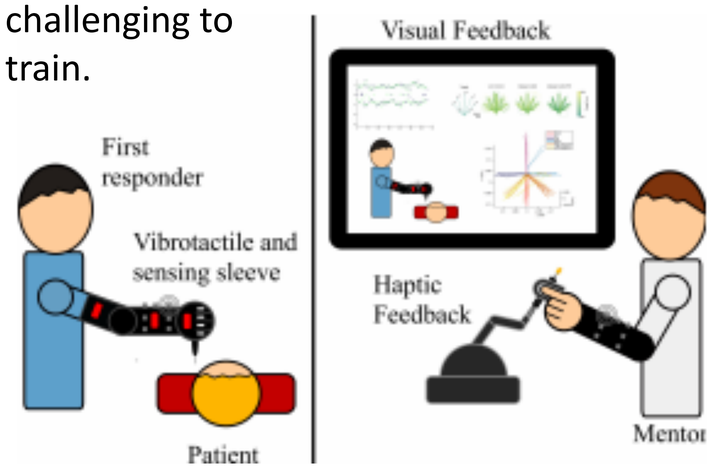
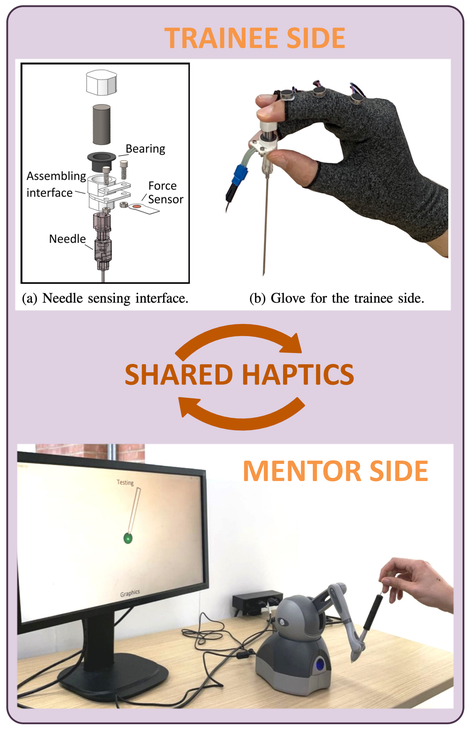
SCIENTIFIC CHALLENGE

Trauma skills require complex spatial coordination, a delicate sense of touch, and ability to work under intense time pressure – all are skills that are challenging to train.

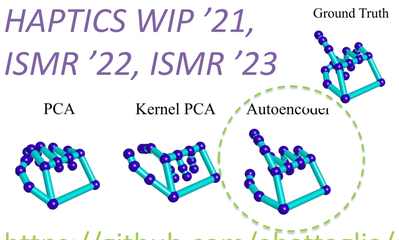


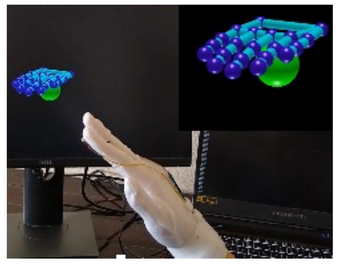
SOLUTION: HAPTIC TELEMENTORING SYSTEM



<== Example applications for training include needle insertion, chest tube placement, and suturing.

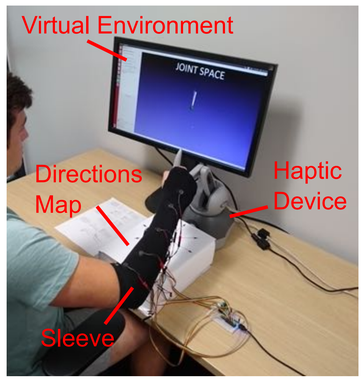
A1.1: Hand posture dimensionality reduction and reconstruction.
HAPTICS WIP '21, ISMR '22, ISMR '23

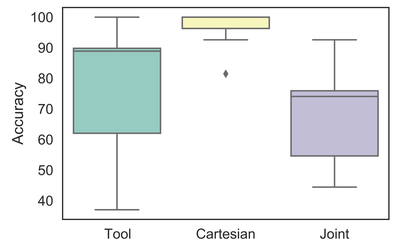


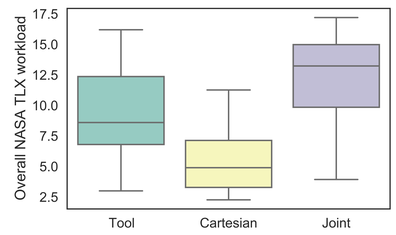


https://github.com/ebattaglia/cHand

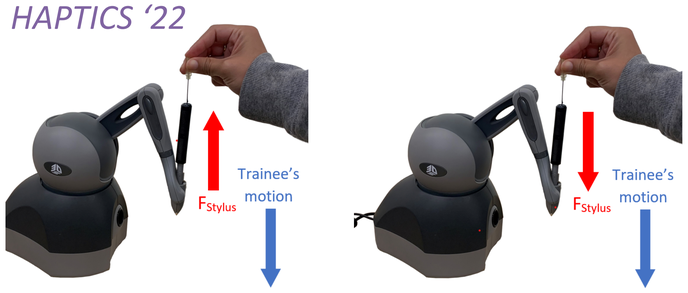
A2: Intuitive Real-Time Tele-mentored Guidance for 2D and 3D Motion *HAPTICS '22*

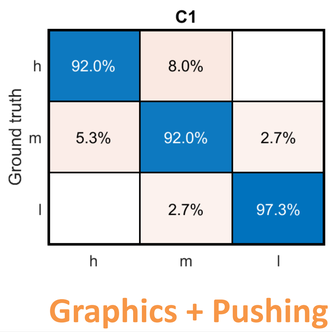




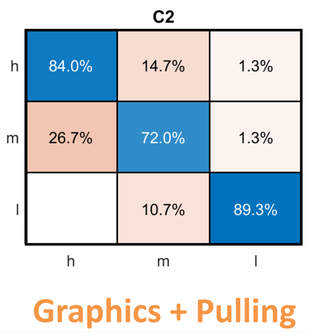


A1.2: Mentor Perception of Trainee Applied Forces
HAPTICS '22

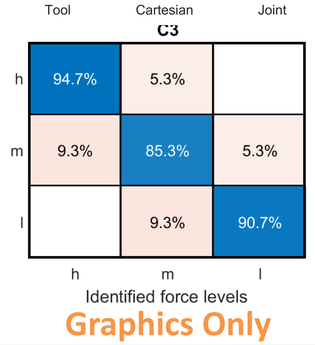




Graphics + Pushing



Graphics + Pulling

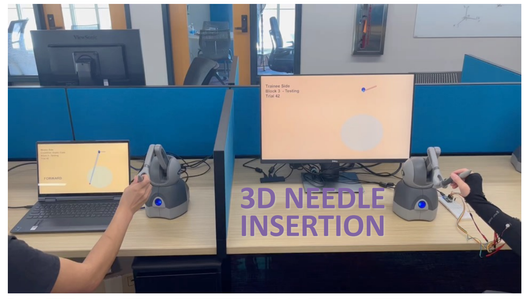


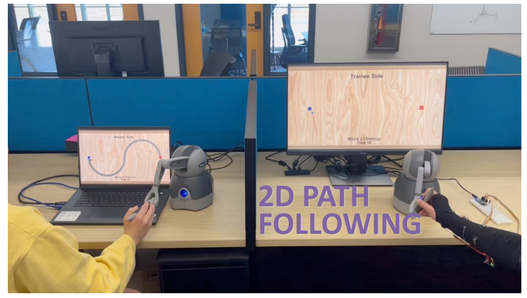
Graphics Only

SCIENTIFIC IMPACT

- Fundamental science of human movement guidance via haptics
- Design of co-robots for medical applications

Towards A3: Real-Time Guidance





BROADER IMPACTS

- Improving healthcare and quality of trauma education through telementoring.
- Team includes 2 REU students + 2 female/URM graduate students.
- Engaging Engineering World Health Undergraduate Students

2023 FRR & NRI Principal Investigators' Meeting
May 2-3, 2023

Award ID#: 2102250