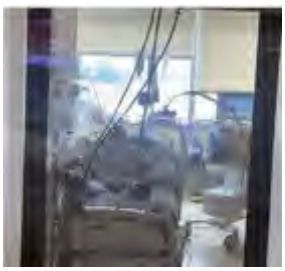
Robotic Operation of ICU Equipment in Contagious Environments

WHY?

- Ventilators and infusion pumps are critical equipment in treating COVID-19
- Routine setting changes require staff to enter Intensive Care Units
- Entering the ICU requires consuming a full set of PPE
- Entering the ICU also exposes staff to risk of infection by COVID-19
- Due to security concerns, equipment can not access networks



"Servo-U" Ventilator, courtesy of Getinge Group

1

Robotic Operation of ICU Equipment in Contagious Environments

Current prototype for single ventilator control:

Balazs P. Vagvolgyi, Mikhail Khrenov, Jonathan Cope, Anton Deguet, Peter Kazanzides, Sajid Manzoor, Russell H. Taylor, and Axel Krieger. Telerobotic Operation of Intensive Care Unit Ventilators. Frontiers, under review.

2

Robotic Operation of ICU Equipment in Contagious Environments

- The goal of this project is to develop robots to enable remote operation of ICU equipment to protect healthcare providers. Tasks could entail operation of multiple ventilators using a mobile base, operation of infusion pumps, and operation of ventilators with knobs.
- **What Students Will Do:**
- **Deliverables:**
  - Prototype robots
  - Demonstrate functionality
- **Size group:** 2-3
- **Skills:**
  - Required: ME Design, Electronics, Programming
- **Mentors:**
  - Axel Krieger, PhD Assistant Professor MechE axel@jhu.edu
  - Balazs P Vagvolgyi, MS Associate Research Scientist LCSR balazs@jhu.edu
  - Sajid H. Manzoor MD, Director of Adult Respiratory Therapy, JHH smanzoo1@jhmi.edu