

Universal Mobile Device Adapter for Endoscopic Image Capture

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Background & Unmet Need

- Endoscopes are essential tools in medicine for minimally invasive viewing of anatomic structures, medical abnormalities, and surgical interventions
- Generally, endoscopes come with a light source, camera cord, and computer processor, which are often stored together in a mobile tower
- However, these large towers are often difficult to transport, and may cause difficulty in settings where endoscopes must be mobile, such as inpatient or emergency care
- Moreover, health providers with limited resources, such as those in low- to middle-income countries, may not be able to afford these devices altogether
- Mobile devices are ubiquitous and have built in high-resolution cameras and advanced processing capabilities
- **Unmet Need:** Adapters allowing for use of mobile devices to record endoscopic images

Technology Overview

- **The Technology:** Portable and universal adapters for capturing endoscopic images on any mobile device
- A team at Weill Cornell Medicine and New York Presbyterian Hospital has created universal endoscope adapters which utilize the video capture and storage capabilities of any mobile device
- One version is a phone adapter that allows attachment of a telescope for optical magnification; a second version allows for recording without a telescope; a third version uses an external camera with cord that plugs into laptops and tablets.
- Adapters can be easily attached to the back of any smartphone case or plugged into any laptop/tablet.
- **PoC Data:** Prototypes have been generated and tested using an iPhone and Microsoft Surface
- Preliminary testing indicates that the adapters can capture high quality endoscopic images, and quality control studies are planned to confirm usability

Inventors:

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Patents:

Provisional Filed

Publications:

N/A

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Cornell Reference:

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Technology Applications

- Capturing endoscopic images in emergency settings where devices need to be promptly deployed
- Capturing endoscopic images in inpatient settings wherein patients' movement is restricted due to immobility or unstable medical condition
- Use in low-resource medical facilities, such as in low- to middle-income countries
- Use in military or field hospital settings

Technology Advantages

- Mobile phone adapter is universal for all smartphone brands and models that have a sufficient camera and does not need to be redesigned for future phone releases
- Adapters work with tablets and laptops, enabling larger screens to be used to improve visualization of endoscopic images

Supporting Data / Figures

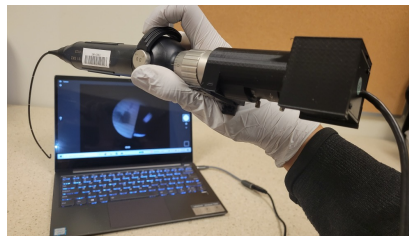
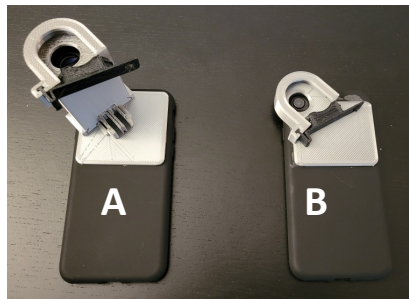


Figure 1: Top: Universal scope adapter with (A) and without (B) telescope for optical magnification. **Bottom:** External camera adapter for laptops and tablets.

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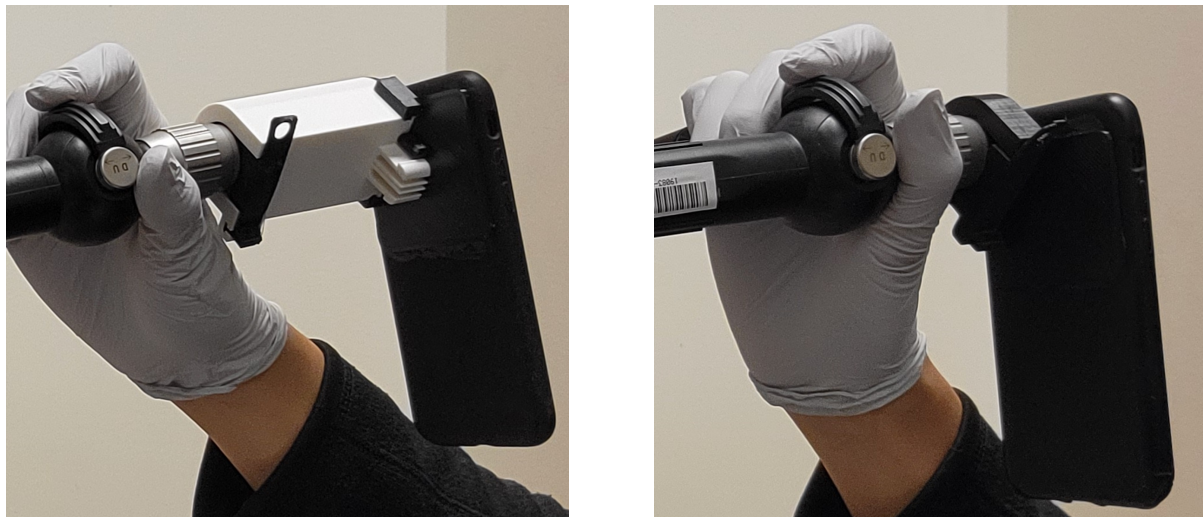


Figure 2: Side view of universal smartphone adapter connecting an iPhone SE to laryngoscope with (Left) or without (Right) the telescope attachment.

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Figure 2: Representative endoscopic images of the larynx captured using the universal smartphone adapter connecting an iPhone SE at 1080p 30 FPS to laryngoscope with **(Left)** or without **(Middle)** the telescope attachment. Footage from external camera adapter for laptops or tablets **(Right)**.

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