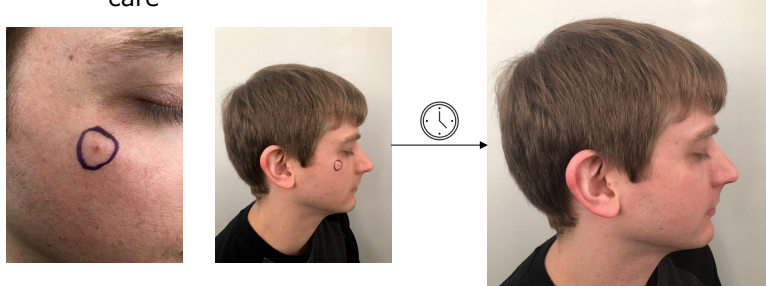


Mixed Reality for Biopsy Site Localization

- **Issue:** Biopsy site determination occasionally difficult
 - Biopsy Site Photography at Hopkins: close-up and far
 - May still be difficult due to various factors¹:
 - amt of time b/t biopsy and surgery
 - biopsy depth
 - background skin disease
 - Wrong site surgery is a **never event**
 - Difficulty w/ biopsy site determination delays patient care



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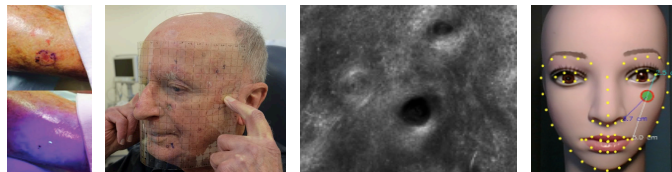
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1

Mixed Reality for Biopsy Site Localization

- Creative Ideas for an Important Issue
 - UV-fluorescent tattoo^{2, 3}
 - Transparency grid⁴
 - Confocal microscopy⁵
 - Smartphone photography and biopsy site "selfies"^{6, 7, 8, 9}
 - Nov 2020: Facial recognition and AR to triangulate biopsy location on static photos¹⁰
 - None incorporated into general practice yet



*We want to translate biopsy site photography **directly onto skin***

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2

Mixed Reality for Biopsy Site Localization

- Skin cancer surgery requires locating the biopsy site, based on photos taken during the biopsy. This can be difficult, especially when time has elapsed between biopsy and surgery.
- **What Students Will Do:** (1) Implement a phone/tablet app to register biopsy images to surgery images, (2) overlay the biopsy site on live camera images taken by the phone/tablet.
- **Deliverables:** Software application; experimental results to evaluate system accuracy
- **Size group:** 1-2 students
- **Skills:** Mobile app development (iOS and/or Android); computer vision/tracking; mixed reality
- **Mentors:** Ashley Antony (aantony1@jhmi.edu), Peter Kazanzides (pkaz@jhu.edu), Jeffrey Scott (jscott98@jhmi.edu), Kristin Bibee (kbibee1@jhmi.edu), Elise Ng (eng9@jhmi.edu)

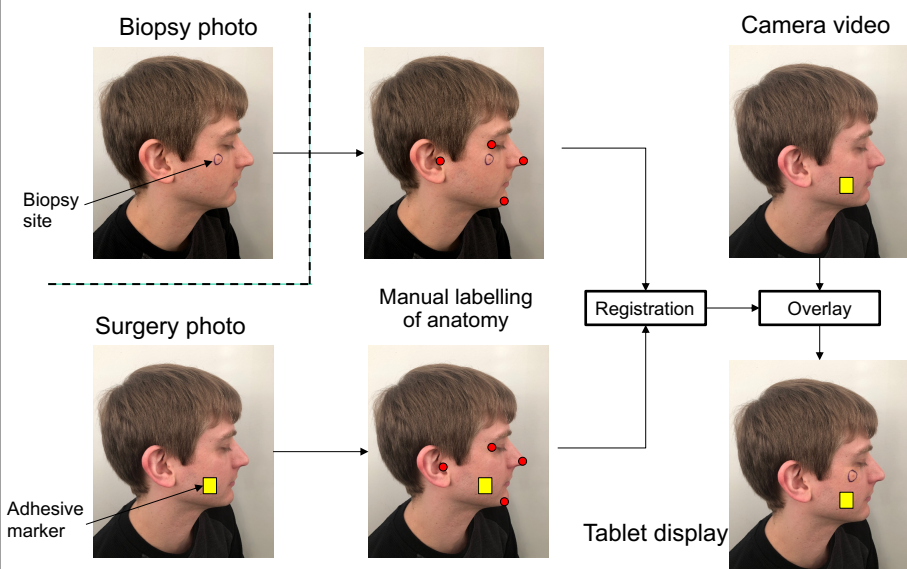
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3

Mixed Reality for Biopsy Site Localization



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4

Mixed Reality for Biopsy Site Localization

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