Project Checkpoint

Surgical Instruments for Robotic Microsurgery

Members

Zaid Ashai

Pranav Lakshminarayanan

Mentors

Kevin Olds

Allen Feng

Dr. R. Taylor

Dr. J. Richmon

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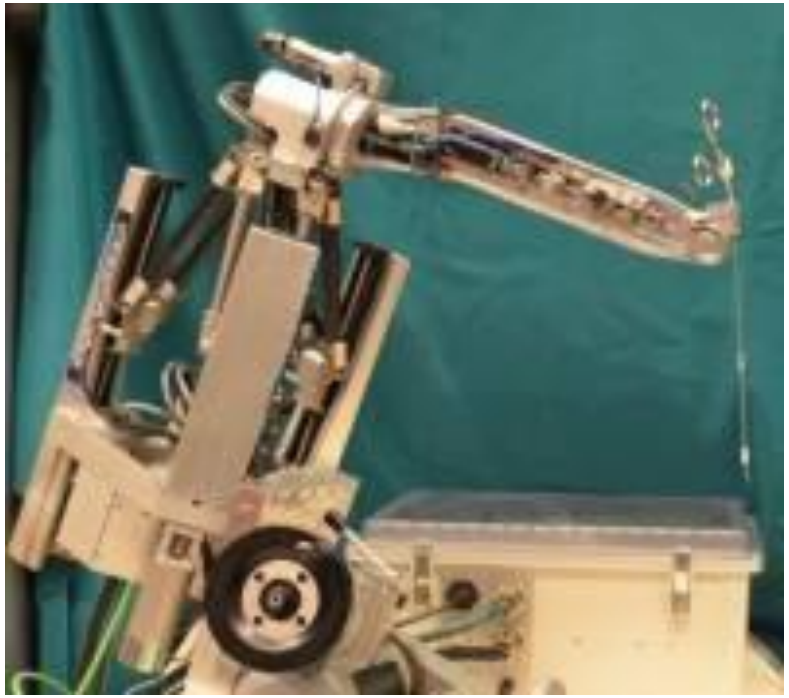
Overview

- Project Summary
- Progress
  - Dependencies
  - Goals met
- Updated Deliverables and Timeline
- Upcoming Milestones
- Summary

Project Summary

Develop and evaluate novel surgical instruments for robot assisted vein suturing



Dependencies

Dependency	✓/✗	Status
Machine shop training	✓	Completed training for basic shop, lathe, and U-Print
Access to steady-hand robot	✓	Trained in use
Materials to design prototypes	✓	Ordered through project funding
Scheduling of mock operations and study	✓	Starting Friday, March 27

Original Deliverables

Minimum

Computer-aided design of:

- suture needle holder
- tool attachment unit

Pilot study with simple tool

Expected

Build designed suture needle holder and tool attachment unit

Implementation of tools with REMS robot

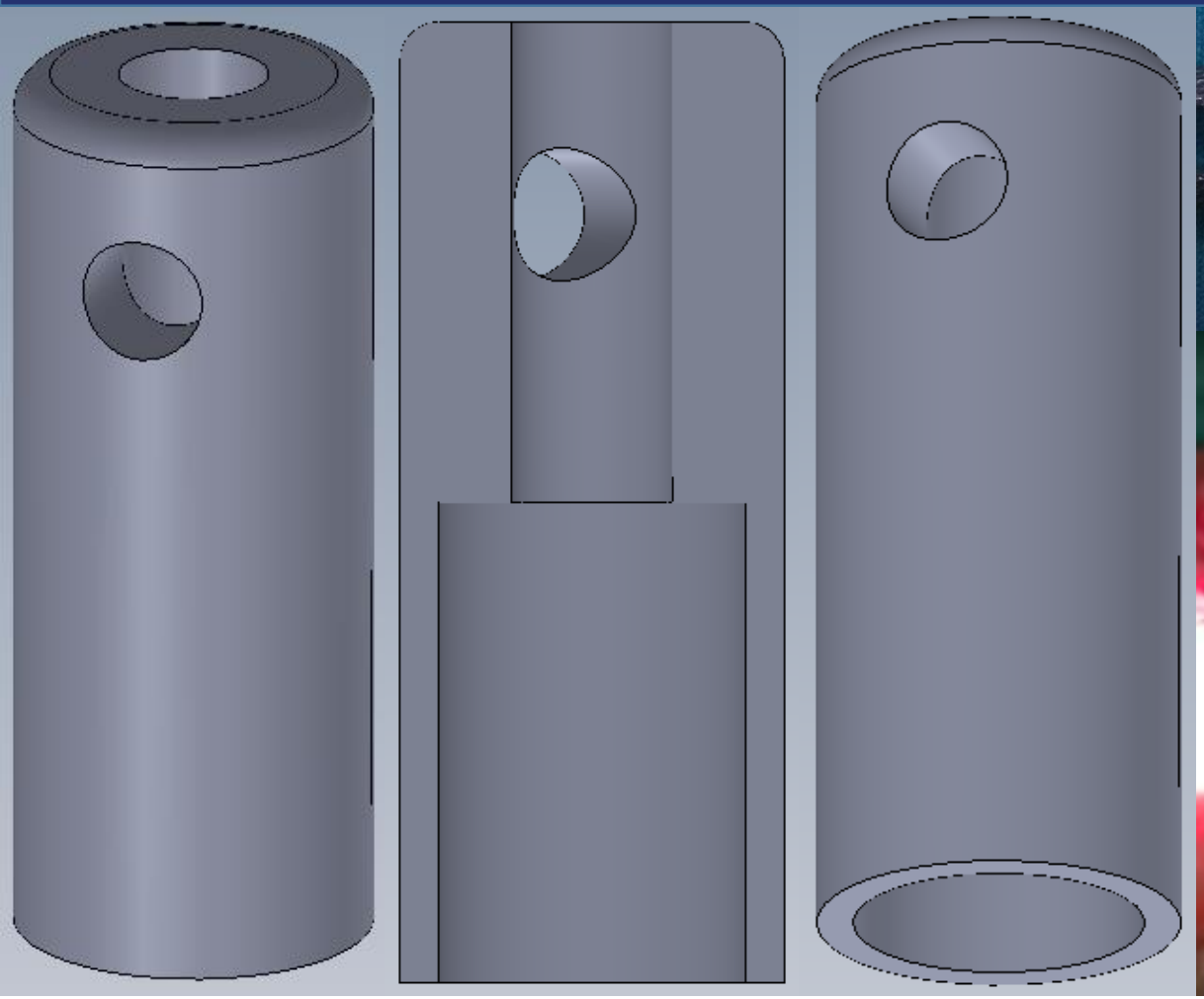
Perform surgical tests in mock OR by Dr. Richmon

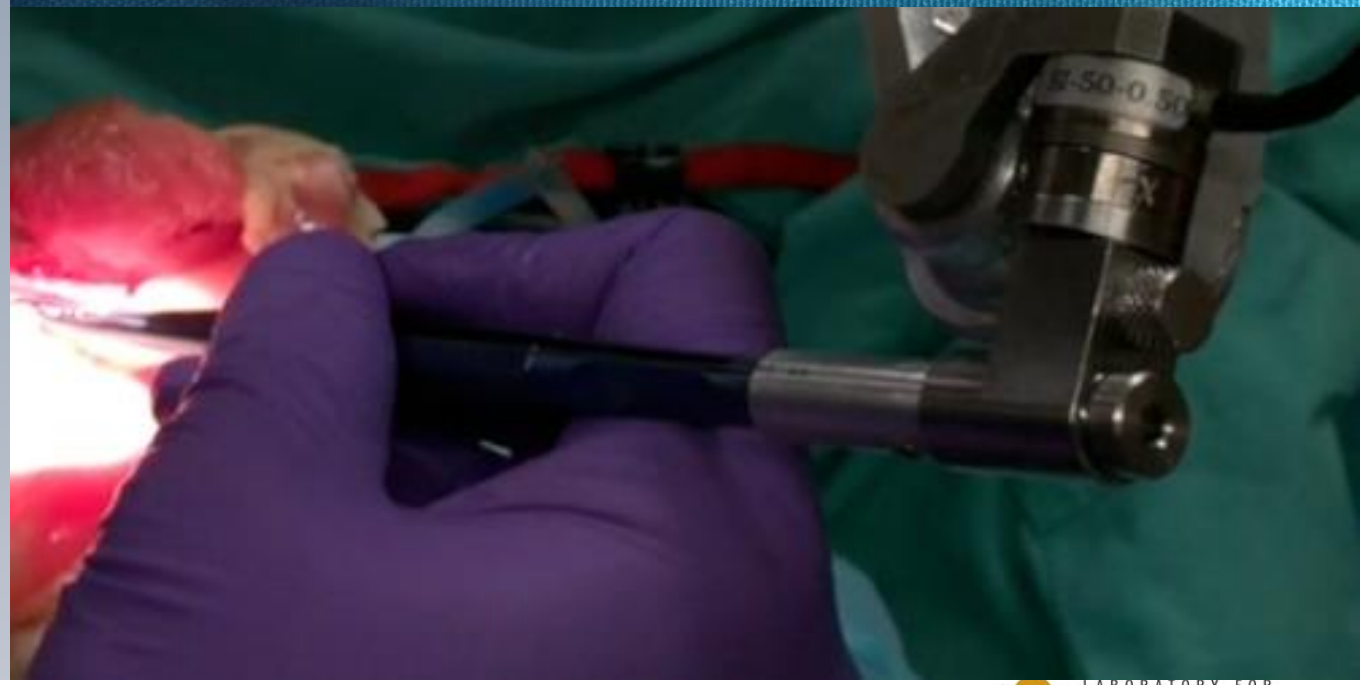
Maximum

Conduct user study on viability of new tools with medical students, under the supervision of Allen Feng and Dr. Richmon

Re-design and optimize the REMS movement algorithm and/or mechanisms

Designs





Deliverables

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✓ Design of forceps adapter

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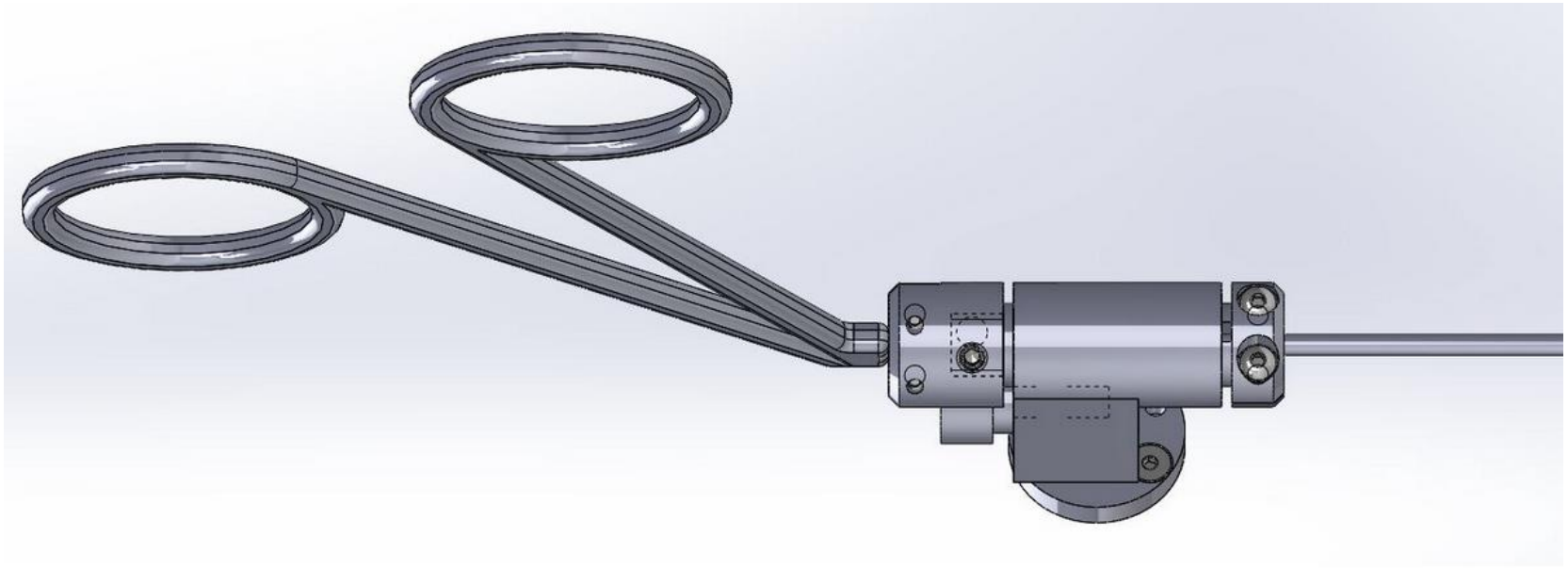

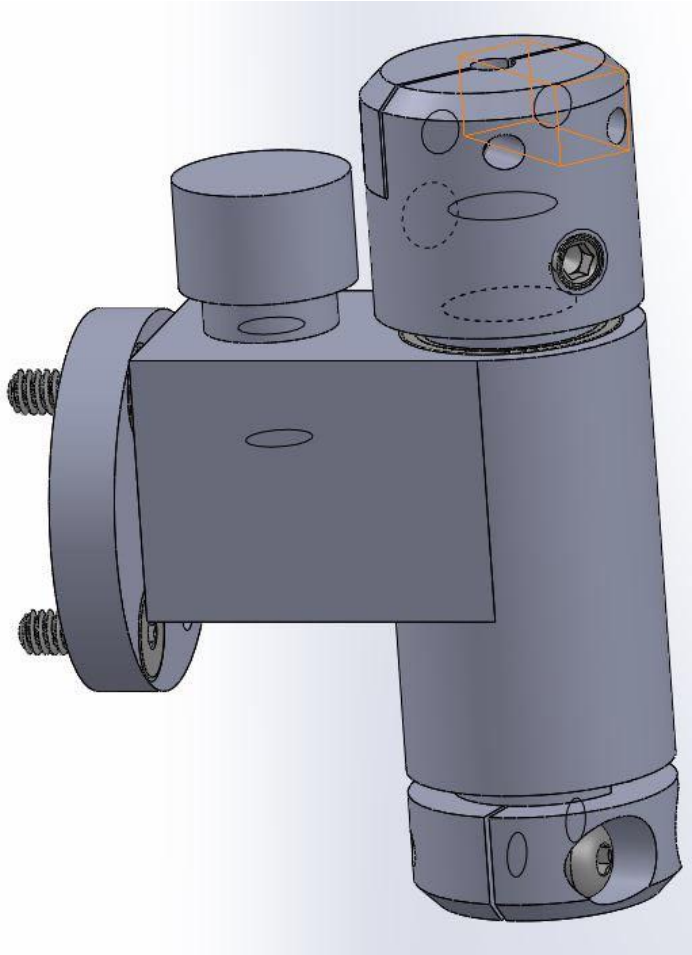

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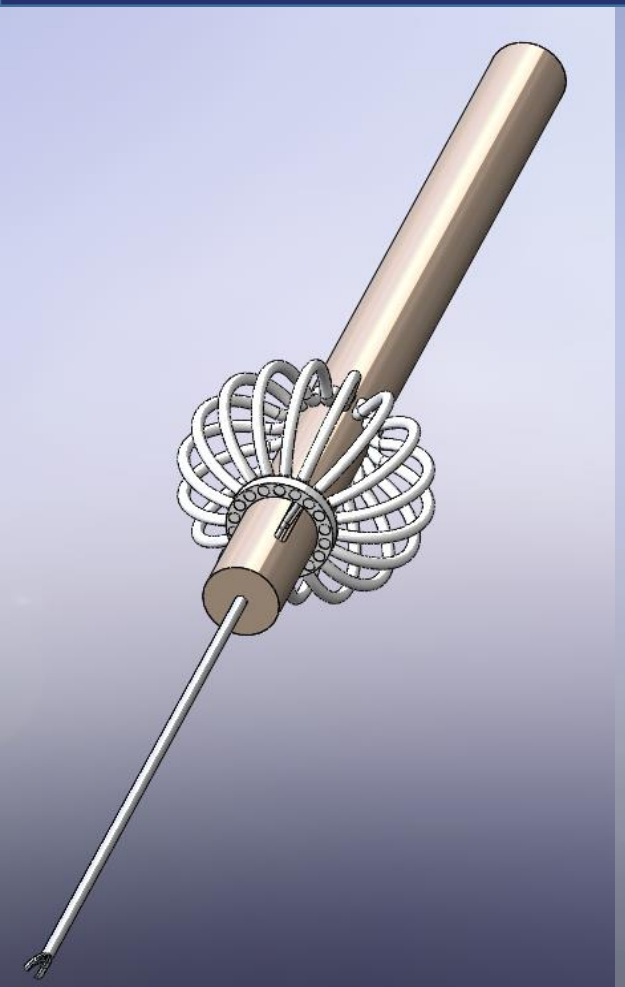

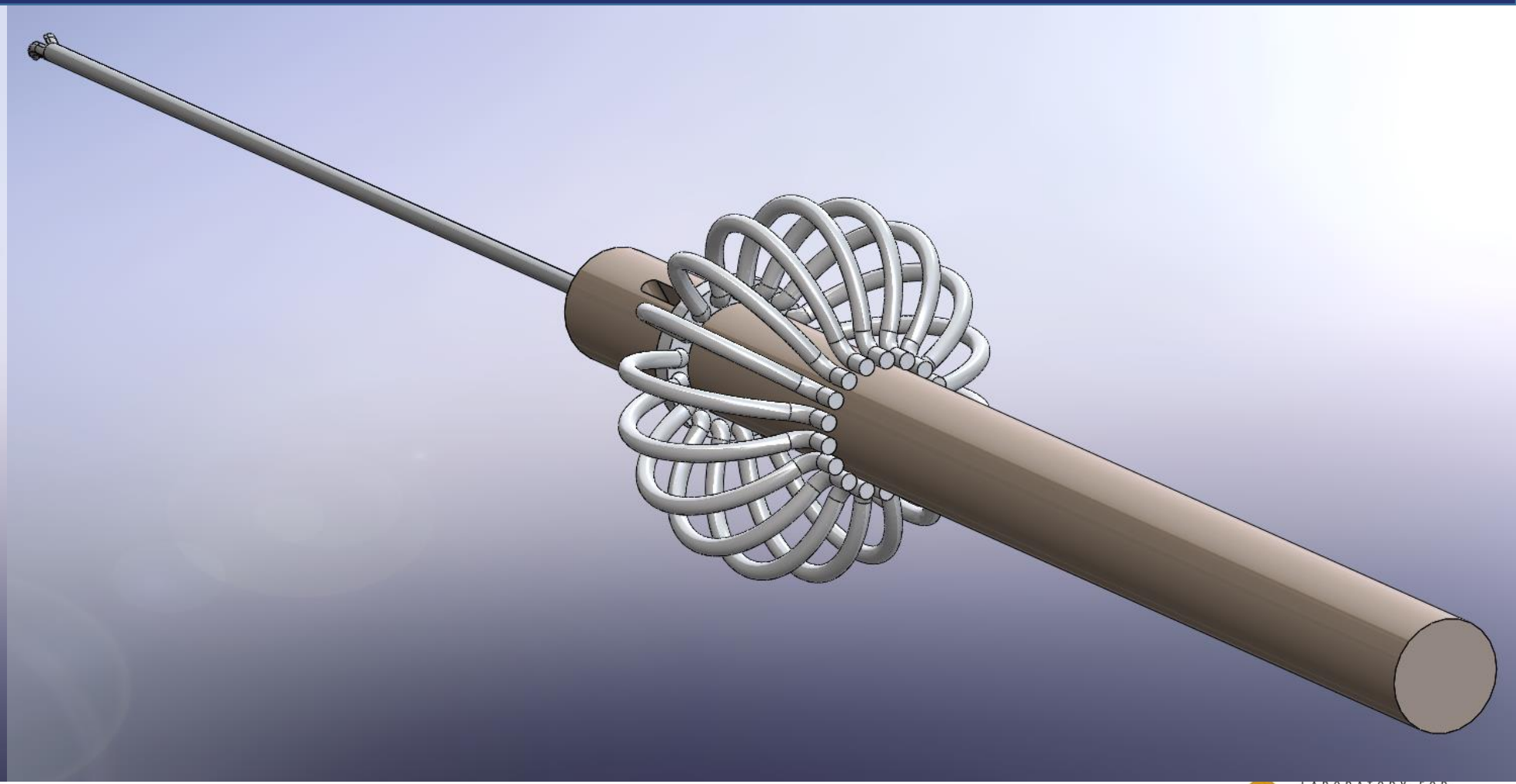

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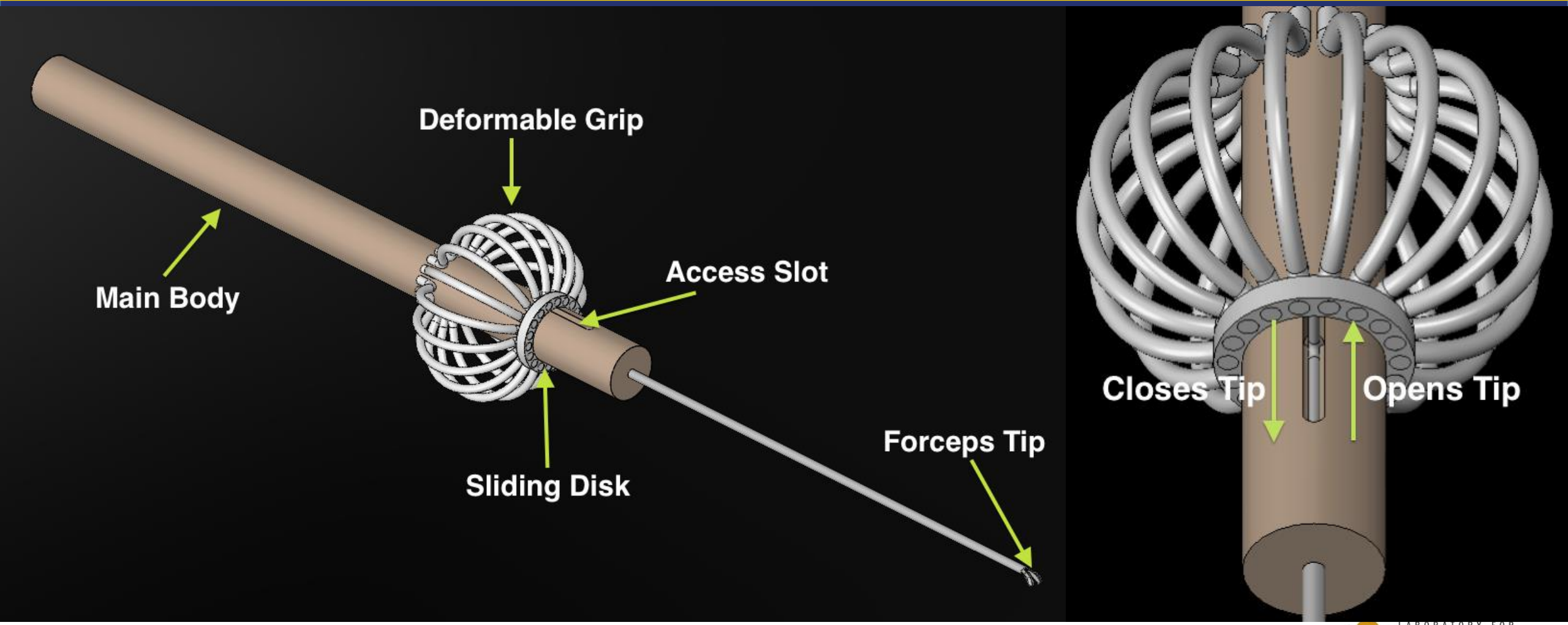
Deformable Grip
Main Body
Access Slot
Sliding Disk
Forceps Tip
Closes Tip
Opens Tip

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Experimental Procedure

- Sample size:
  - 10 medical students
  - 5 residents
  - Possibly 1 attending physician
- Tested on store-bought chicken
- Evaluate both freehand and robot assisted

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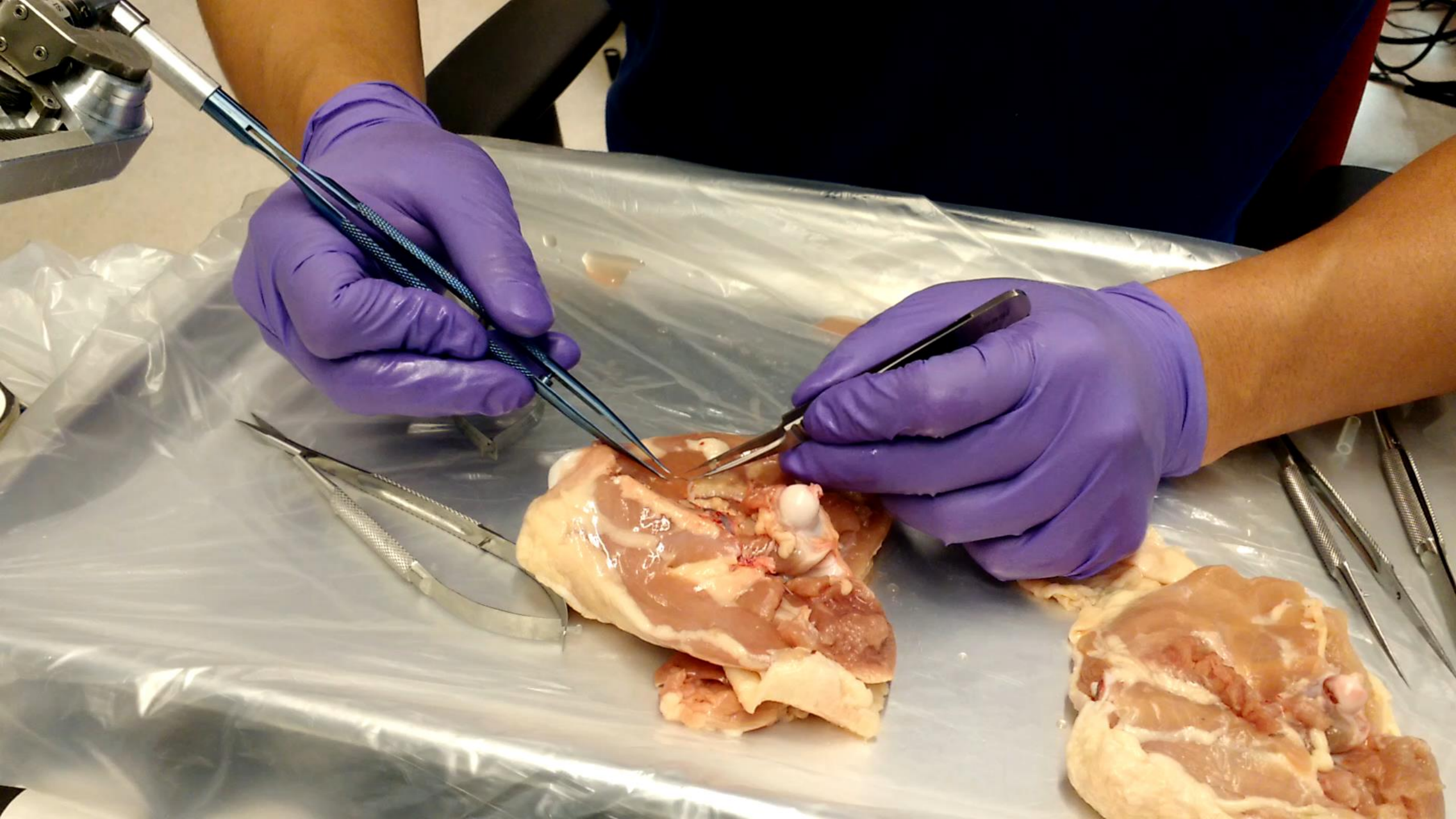

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Rapid Prototypes

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Updated Deliverables

Minimum

- ✓ Design of forceps adapter
- ✓ Computer-aided design of:
  - suture needle holder
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Expected

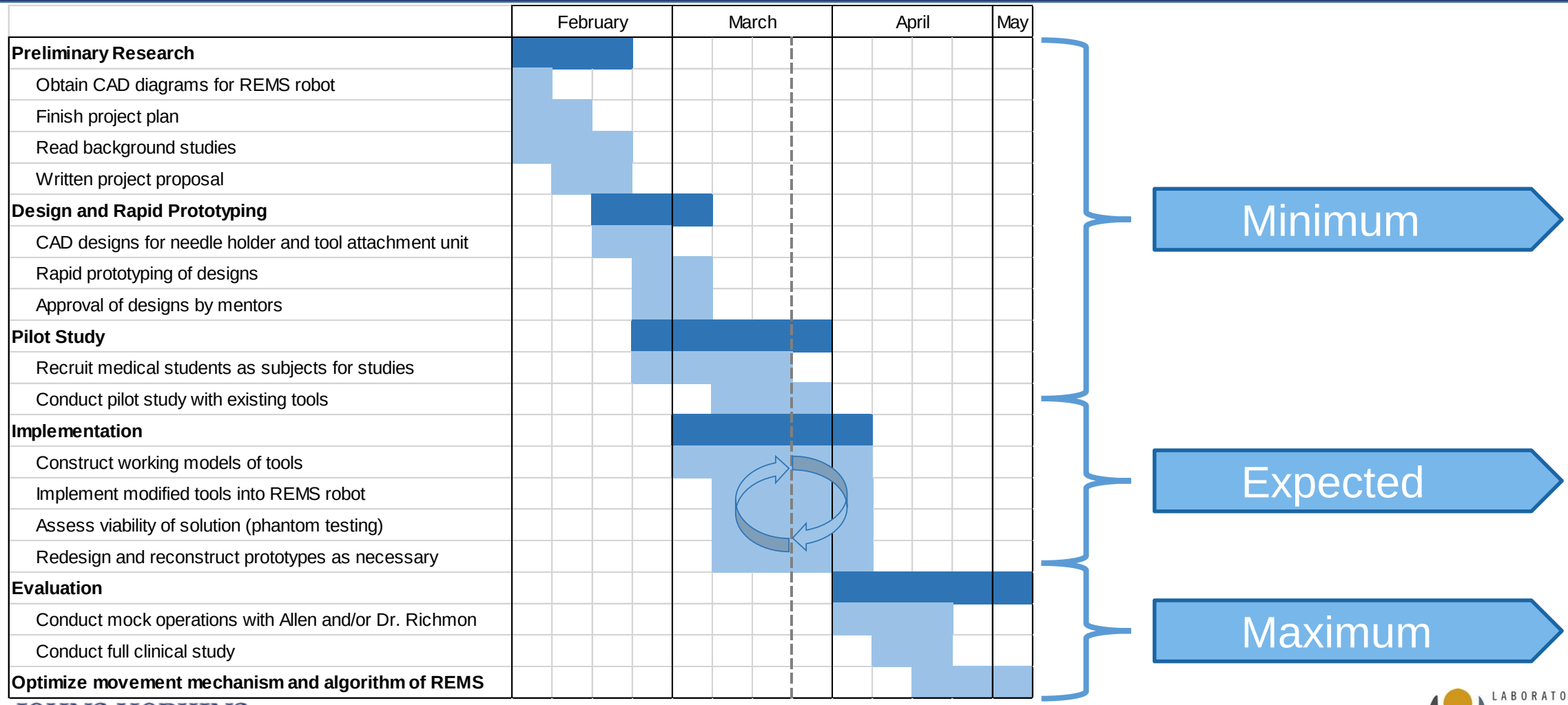
- ••• Build designed suture needle holder and tool attachment unit
- ••• Implementation of tools with REMS robot
- ••• Perform surgical tests in mock OR by Dr. Richmon

Maximum

Conduct clinical study on viability of new tools with medical students, under the supervision of Allen Feng and Dr. Richmon

~~Re-design and optimize the REMS movement algorithm and/or mechanisms~~

Original Timeline



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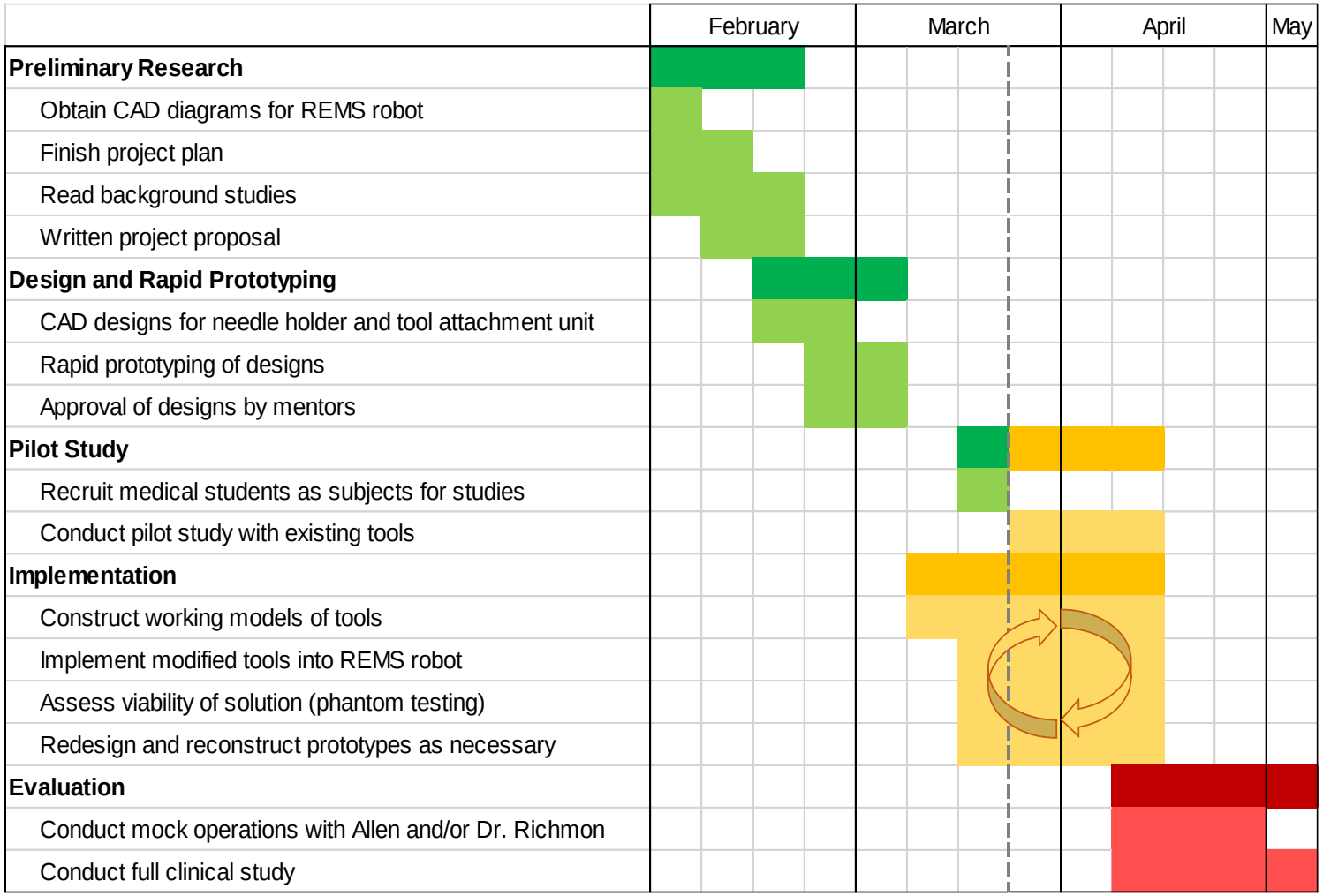
Updated Timeline



Completed

In Progress

Upcoming

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Upcoming Milestones

Milestone	Date
Control trial of simple tool with Dr. Richmon	Scheduled for April 2
Construction of new tool	April 10
Mock operations with Allen and Dr. Richmon	Complete by April 20
Clinical trials	Complete by April 30
Poster Presentation	May 8

Summary

- Currently in building phase
  - Acquiring materials
  - Construction, testing, and redesigning in progress
- One week behind original schedule
- Updated maximum deliverables

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