13/03 - Meeting with client

Date: 13/03/2025

Location: HIVE

Attendees: Catherine, Joe, and whole team

▼ Discussion points

▼ Q&A about admin matters

▼ Access to GPU and training resources

- Murph raised concerns about access to GPU and computing resources.

  ⇒ Action: Joe said the team needs to consult the university regarding the possibility of uploading everything to a large computational server (need to follow up)

▼ End Users of the Program

- The software is intended for users analyzing knee functions, including engineers and surgeons, who may have some knowledge of knee anatomy but lack technical expertise in coding or technology.

  ⇒ Implication: The program flow must be intuitive to accommodate non-technical users.

▼ Project Expectations

- The goal is to apply modern machine learning techniques to improve efficiency compared to Mark's previous work, there is no expectation about the exact speed or efficiency

- Catherine suggested focusing on a specific section of the project.

- Joe noted that the MATLAB codebase is disorganized, lacks comments, and is difficult to understand.

▼ Team Composition & Workflow

- The team has the flexibility to propose its own composition and workflow.

- Joe inquired whether team members have discussed individual skills and interests (yes)

- Catherine emphasized the importance of maintaining a single source of truth

  ⇒ Action: a landing page

- Murph asked whether the data should be stored locally or on the web. The decision was to keep it **local**.

▼ Sprint Planning & Task Breakdown

- Punit requested guidance on dividing tasks into sprints.
- Catherine advised defining the program's features and tackling one section per sprint.

⇒ Action: The team should finalize the feature list and work plan by the end of the day to confirm with Mark.

▼ Segmentation Documentation

- Punit inquired about existing documentation for segmentation.
- References include Mark's research papers.

⇒ Action: Look at CT scans to familiarize with bone structure.

▼ Flow of the program
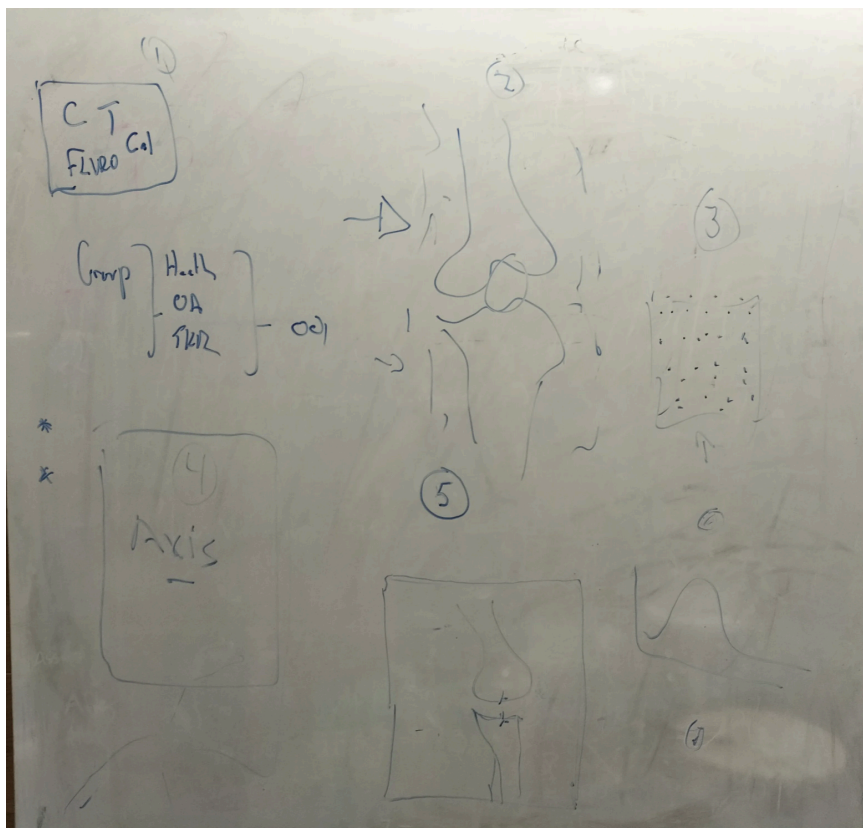
Aung successfully installed the program and requested guidance on usage.

1. Data

   - Import the 3D thing (CT, MRI, etc.), the 2D thing and calibration grid
   - Find the group

- - Healthy
    - OA
    - Total knee replacement
  - Get the patient number
2. Segmentation
   - Remove non-relevant elements from the dataset
   - Processing time varies based on dataset quality:
     - Good CT scans: ~30 minutes.
     - Poor-quality images: Longer processing time.
3. Calibration
   - Calibration grid got from the fluoro → distances and distortion
4. Defining an origin and a reference system (axes and coordinate system) - not necessarily done by the team
   - Define origin, axes, and coordinate system.
   - Multiple approaches available.
5. Overlay the 3D CT onto the 2D video
   - Align 3D and 2D images to achieve the best match
6. Calculate the motion from the previous projection
7. Visualize the motion of the bone relative to one another ⇒ useful for clinical procedure

▼ Action items

- Research on 3D Slicer and Simpleware
- Develop the landing page
- Finalize team composition and work plan