# Advanced Desktop App for Audio Acquisition (ADA3)


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# Contents

# Introduction

- Computer Aided Auscultation System(CAAS)
  - Bodytune
  - Desktop application
- 5 different versions of GUI with various functionalities
  - ADOS
  - Bodytune
  - Bodytune and Acquisition
  - Stream
  - Ortho

# Motivation

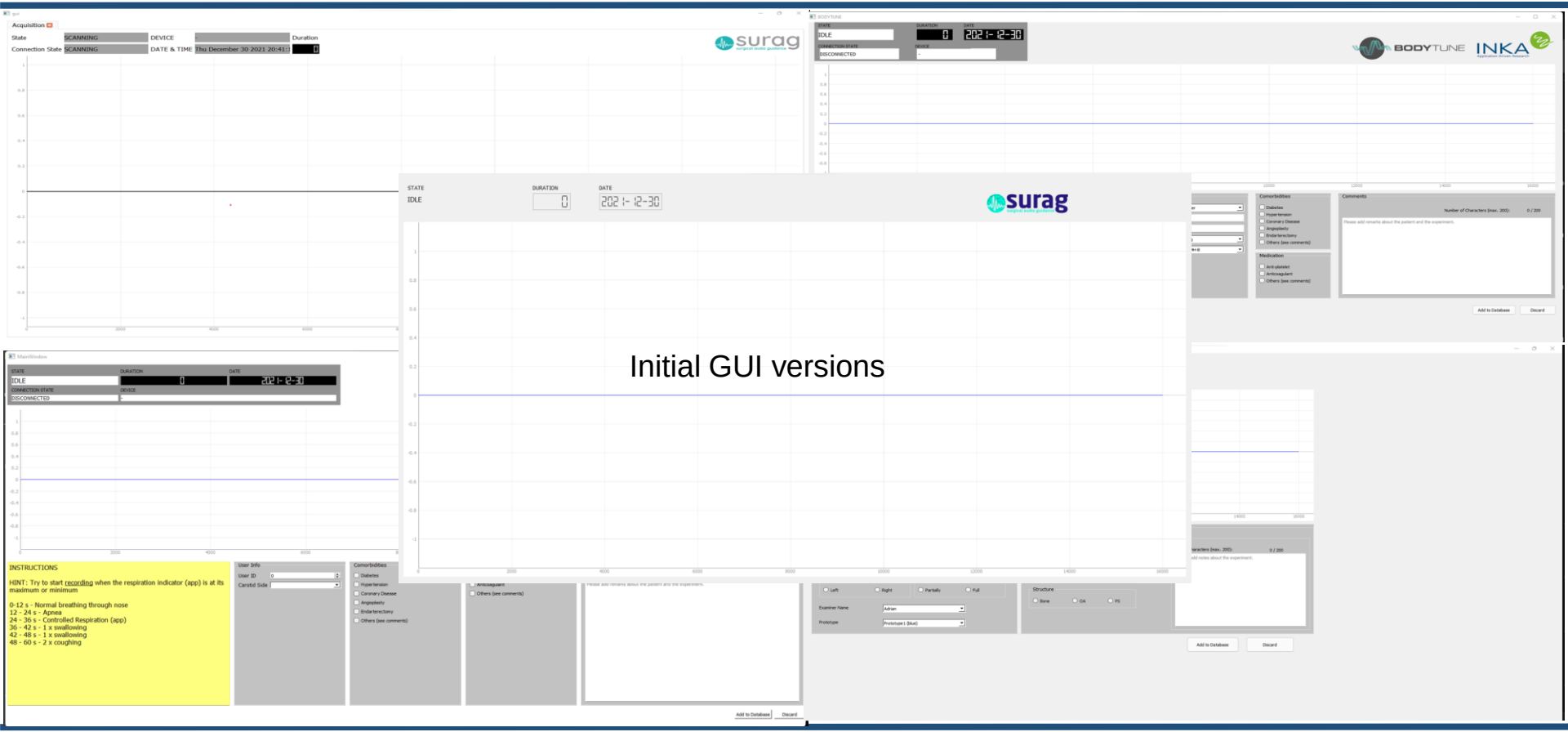
- 5 versions of GUI will lead user to install 5 different applications
- Different GUI's with individual database systems
- Buttons on Body tune are hard to use during examination

# Project Goal

- An application which provides access to all versions of GUI's
- Installer for the application for Windows OS
- Local storage of data in a single location
- Two-way communication between the application and Bodytune device
- LED concept in the Body tune

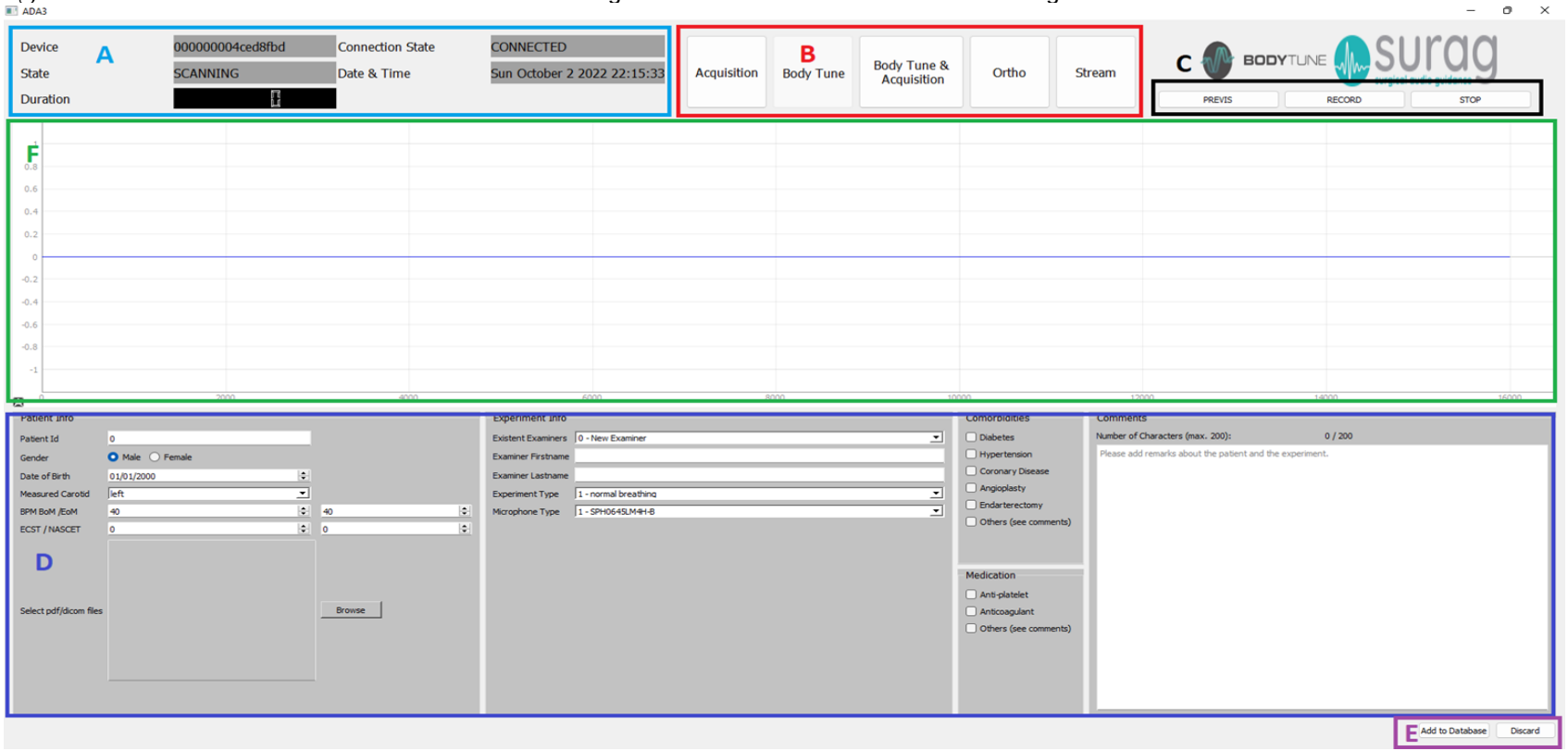
# ADA3(Advanced Desktop App for Audio Acquisition)

- ADA3 desktop application features
  - Provides access to different GUI versions
  - Common database
  - Visualization of the audio from the Bodytune
  - Add patient, measurement, examiner information
  - Add additional files
  - Control Bodytune operations (visualization, record, stop) from GUI


Initial GUI versions

# Integrated GUI

A: Control center B: Tab widget C: Control buttons D: Annotation widget E: save and clear button F: Visualization widget



# GUI versions and functionality

- Visualization widget
- Annotation widget
- Different versions of the GUI:
  - BODYTUNE GUI
    - All experiments for a total of 60 sec
    - Developed for doctor's
  - BODYTUNE ACQUISITION GUI
    - Each experiment carried out for a particular time
    - Developed for researchers
  - ORTHO GUI
    - Acquiring audio data in an orthopedic setting
  - Acquisition
    - post-processing of audio data and display of the results
  - Stream
    - real-time visualization of audio data

# Database

- Files are saved locally in a file format
- Patient information, Examiner information, Experiment information saved in a text document (.txt)
- Audio file received is saved in a wave file format(.wav)
- Additional files of format(pdf, dicom) can be saved

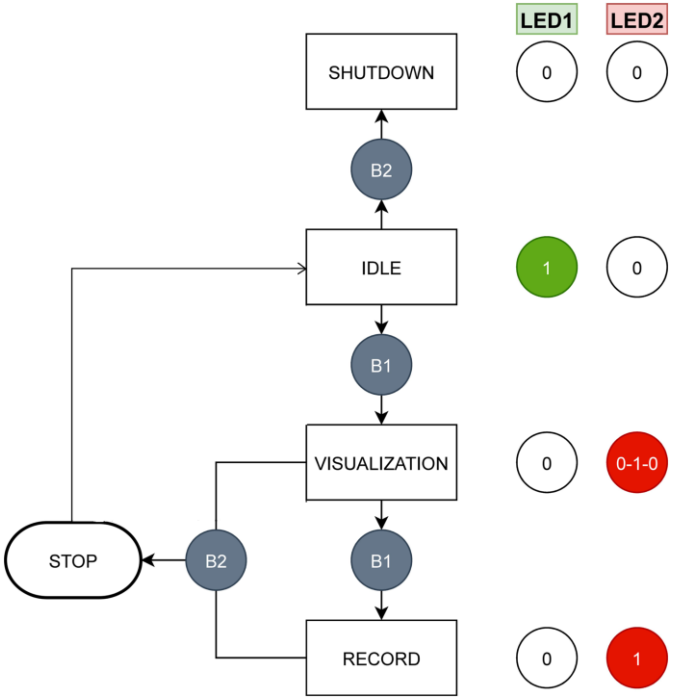
# Folder structure

- A folder named “Database” is created in the application installation directory
- Files with respect to each GUI is saved under
  - Bodytune
  - BodytuneAcquisition
  - Ortho
- Patient details are saved in a folder with his ID/name
  - Every text document,wave files are created with a unique name

```
C:\Users\harsh\Desktop\ADA3\Database>tree /f
Folder PATH listing for volume OS
Volume serial number is 86C4-1288
C:.
├───Bodytune
│   └───BT-196
│           ADA3 Project abstract.pdf
│           BT-196-2022-10-02_22-32-13.txt
│           TMP-196-2022-10-02_22-32-13.wav
│
├───BodytuneAcquisition
│   └───harsha
│       └───BA-198
│               ADA3 Project abstract.pdf
│               BA-198-2022-10-02_22-35-23.txt
│               TMP-198-2022-10-02_22-35-23.wav
│
└───Ortho
    └───OR-harshavardhan
            ADA3 Project abstract.pdf
            OR-harshavardhan-2022-10-02_22-37-15.txt
            TMP-harshavardhan-2022-10-02_22-37-15.wav
```

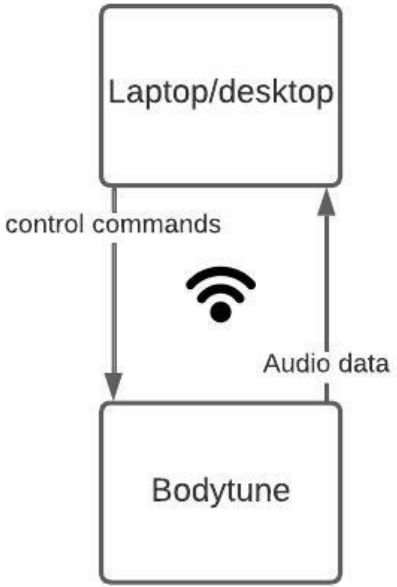
# LED Concept

| State | Button activity |
|---|---|
| Visualization | Button-1 press once |
| Record | Button-1 press second time |
| Stop | Button 2 press |
| Idle | - |
| Shutdown | Button 2 pressed twice |

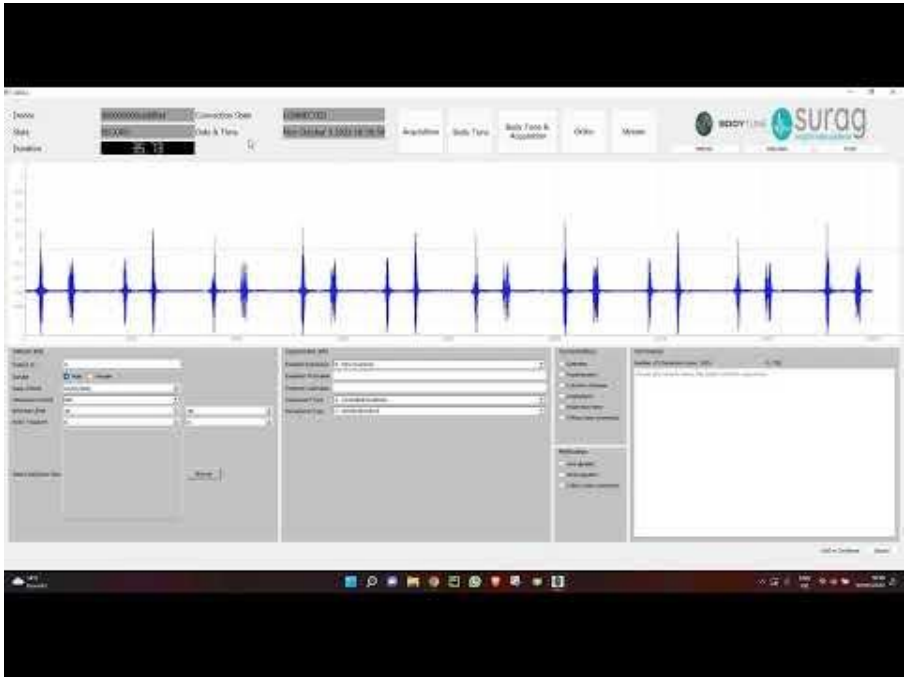


# Two-way communication


- Wireless communication
- Laptop hosts the mobile hotspot
- Audio data is streamed from Bodytune to the laptop
- Control command (Visualization, record, stop) are sent from laptop to Bodytune



# Video Demo



# Failed deliverables

- Application for Linux and macOS
  - macOS: Cannot create hotspot simultaneously with Wi-Fi
  - Linux (Ubuntu 20.04): Body tune unable to connect to hotspot
- Adapt the version to Bluetooth
  - The bit size in the RPI is very less, so data transferred through Bluetooth functionality is delayed

# Further Developments

- Timer for experiments
  - Countdown timer where we can enter the amount of seconds we want to carry out each experiment
- Visualization of pre-recorded audio clips
  - Able to visualize already recorded audio clips