Painkiller Injection System

User Manual

CS132: Software Engineering

Group 15
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1 System Architecture

The system architecture is shown below:

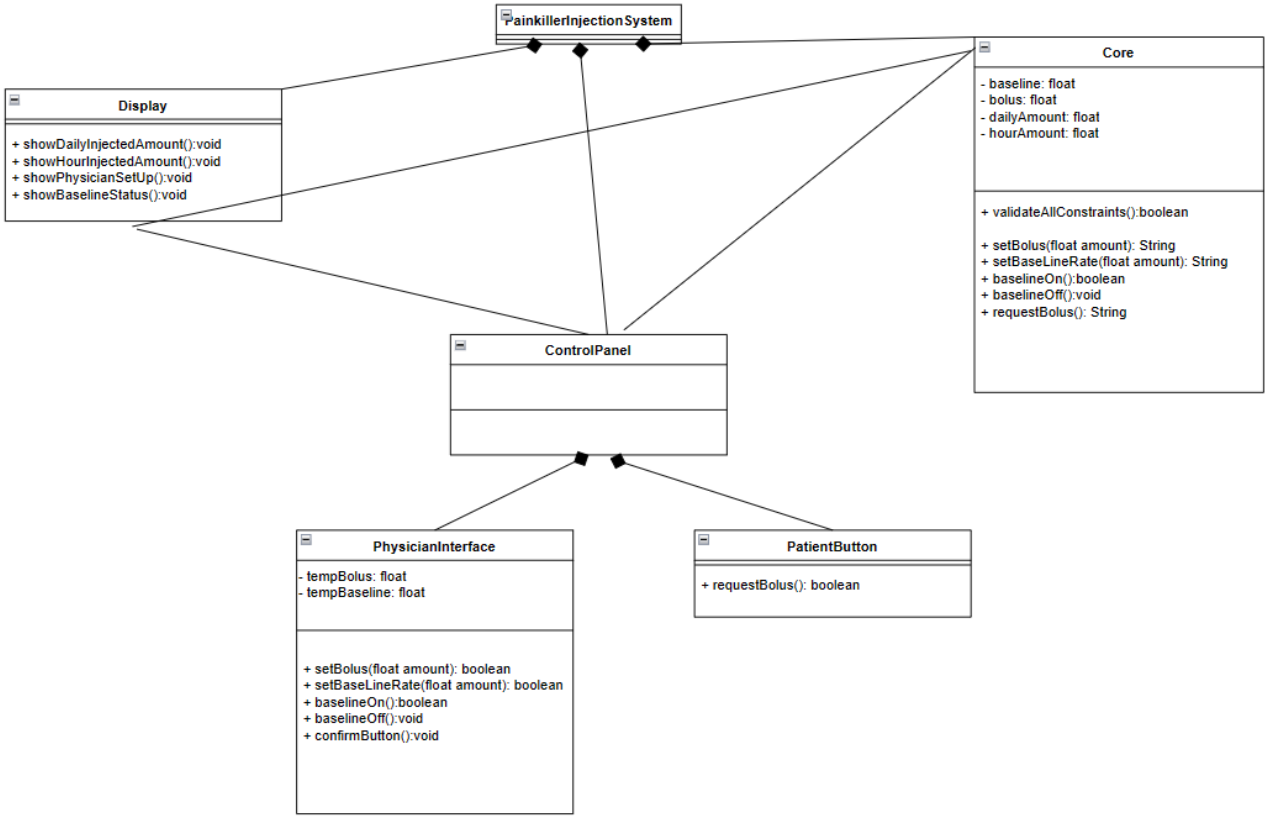

Figure 1: System Architecture

2 DoctorAPP

2.1 Overview

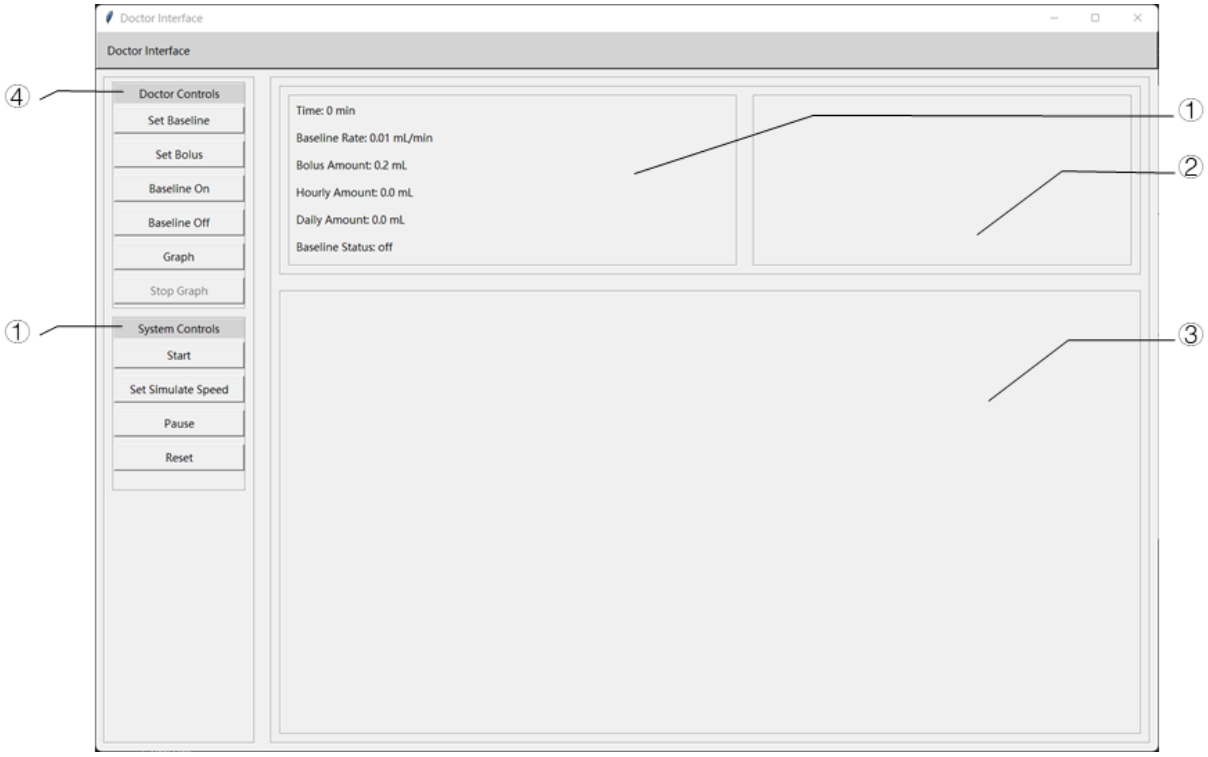

Figure 2: DoctorAPP Overview

- **Area I: Injection Information Display Area.** This area displays real-time information about injections, including dosage and timing.
- **Area II: Parameter Adjustment and Feedback Area.** This section allows the user to adjust various parameters related to the injection system and view the corresponding feedback.
- **Area III: Real-Time Chart Area.** Here, real-time data is visualized in the form of charts, allowing for easier monitoring and analysis.
- **Area IV: Doctor Controls Area.** This area contains buttons for controlling the overall system, such as setting baseline and bolus parameters, turning the baseline on or off, and starting or stopping graphs.
- **Area V: System Controls Area.** This section provides control buttons specifically for the doctor to interact with the system, including starting the system, setting simulation speed, pausing, and resetting the system.

2.2 Button Area

2.2.1 Doctor Controls Area

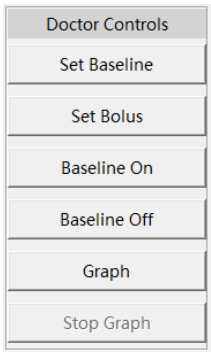

Figure 3: Area IV Doctor Controls Button Area

1. **Set Baseline**: This button allows you to set the baseline injection rate. When pressed, the interface shown in the image appears in Area II, allowing you to adjust the baseline rate. Upon successful adjustment, the "Set Baseline" button in the interface will confirm the setting.

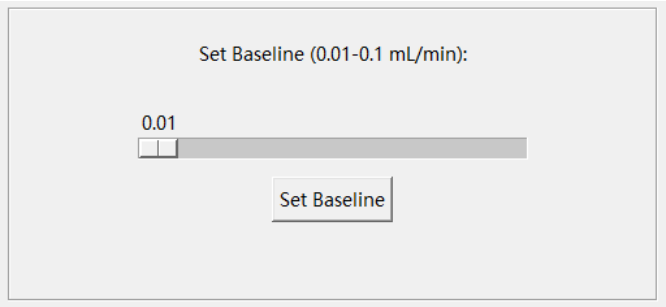

Figure 4: Set Baseline

2. **Set Bolus**: This button sets the bolus injection rate, similar to the baseline setting. When pressed, the bolus interface appears in Area II, allowing rate adjustment. Successful setting is confirmed by pressing the "Set Bolus" button in the interface.

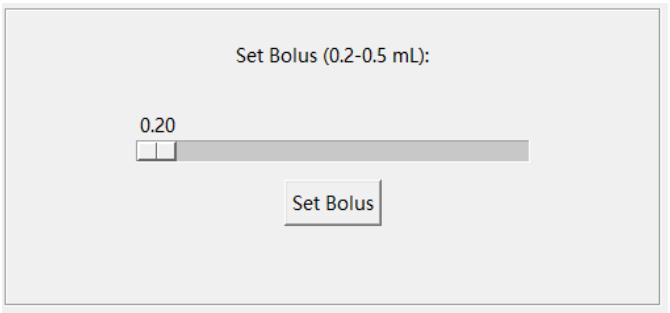

Figure 5: Set Bolus

3. **Baseline On**: This button turns on the baseline injection. When pressed, Area II returns the message "Baseline injection turned on."

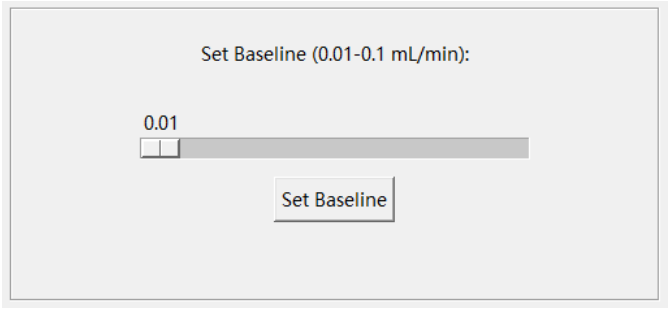

Figure 6: Baseline On

4. **Baseline Off**: This button turns off the baseline injection. When pressed, Area II returns the message "Baseline injection turned off."

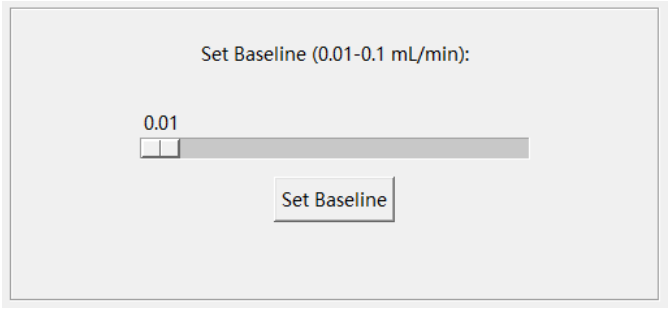

Figure 7: Baseline Off

5. **Graph**: This button generates a real-time data chart in Area III. When pressed, a real-time data chart is generated in Area III, as shown in the image. Concurrently, the "Graph" button in Area IV is disabled, and the "Stop Graph" button is enabled, as shown in the next image.

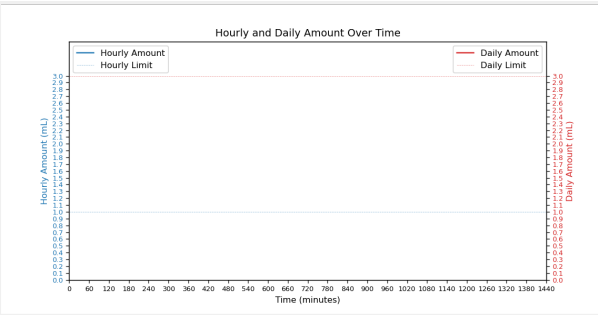

Figure 8: Graph

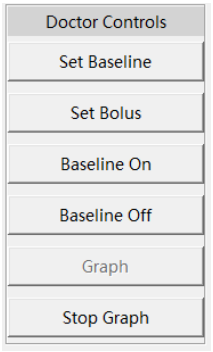

Figure 9: Stop Graph Enabled

6. **Stop Graph**: This button stops the graph generation and clears the chart in Area III. When pressed, the chart in Area III is cleared, the "Graph" button in Area IV is re-enabled, and the "Stop Graph" button is disabled. Additionally, Area II returns the message "Graph stopped."

2.2.2 System Controls Area

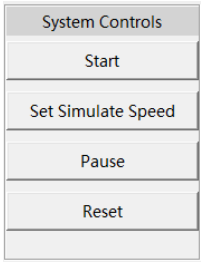

Figure 10: Doctor Controls Button Area

1. **Start**: Pressing the "Start" button initiates the injection simulation in Area I. The message "Simulation started." is displayed in Area II. Additionally, the "Start" button in Area V is disabled, as shown in the image below.

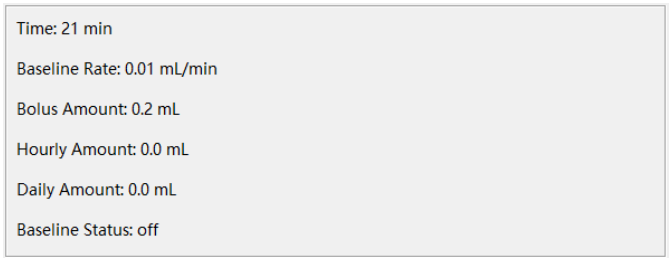

Figure 11: Start

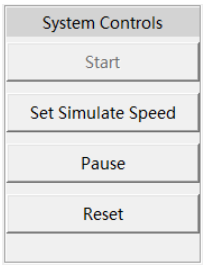

Figure 12: Start Button Disabled

2. **Set Simulate Speed**: This button allows you to adjust the simulation speed, ranging from 1x to 5x. Pressing the "Set Speed" button confirms the adjustment, as shown in the image below.

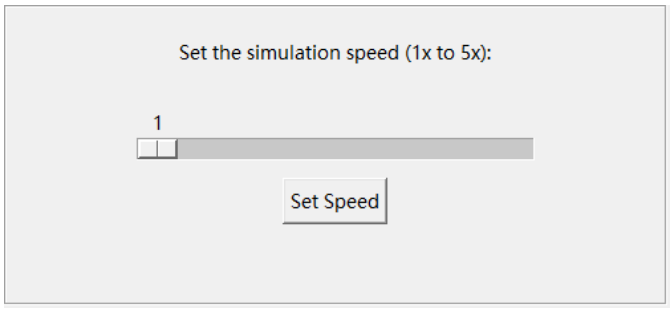

Figure 13: Set Simulate Speed

3. **Pause**: Pressing the "Pause" button halts the simulation, allowing for observation. All buttons in Areas IV and V are disabled, as shown in the image below. Area II displays the message "Simulation is paused. Press the 'Resume' button to restart the system." along with the "Resume" button. Pressing "Resume" will restart the simulation, returning Areas IV and V to their pre-pause state and displaying "Simulation resumed." in Area II.

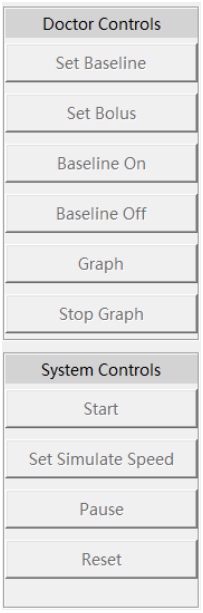

Figure 14: Pause

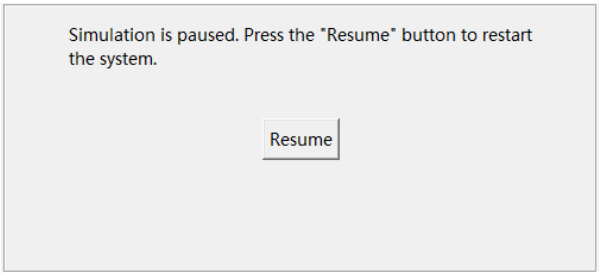

Figure 15: Resume Button

4. **Reset**: Pressing the "Reset" button will return all areas to their initial state as shown in the overview.

2.3 PatientAPP

The PatientAPP contains a single button function: "Request Bolus". When pressed, there is no immediate feedback or output for the user. However, changes in injection status and dosage can be observed in the DoctorAPP, where the injection fulfillment and dosage variations are displayed.

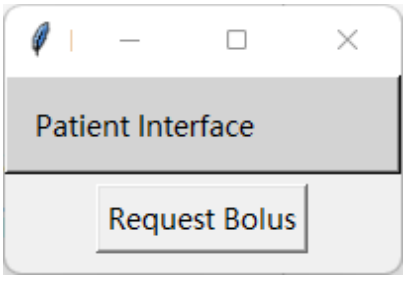

Figure 16: PatientAPP Overview