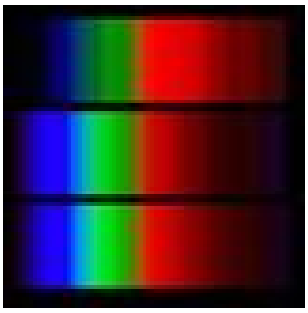

Technology Demo Flight Plan

2022-11-29

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Overview

The purpose of this document is to elaborate the technical challenges that are specific and intrinsic to our project and present ways that we will mitigate those challenges, either via technology demonstrations or plans for implementation.

Overview:

Based on our requirements acquisition work and current understanding of the problem and envisioned solution, the following are the key technical challenges that we will need to overcome in implementing our solution:

C1: Operational GUI

The basic challenge of implementing the interface for our web application is to create one which possesses the various fields that our user will need to send a fully-formed operation request to our middleware.

C2: Backend Messaging

The challenge here is to create real time messaging between our backend and our various subsystems. This is a major portion of the project, as all of these moving parts need to work together in order to form a functional piece of software.

C3: Database Access

The challenge of accessing the database from the frontend will be addressed by providing a simple button that stores a single entry directly into the database.

C4: Automatic Celestial Object Finding

The challenge of allowing the user to query for the celestial object that they wish to view by name is connecting a library which performs this functionality to the frontend.

C5: File Writing

The primary challenge of creating a file-writing module for our project is creating a means of parsing and formatting the data to be written. The input data will likely be in JSON format while the output must be in FITS, a specialized format used for astronomical data.

C6: Data Representation

To represent data, we need to be able to retrieve data from the database, then use that data to produce a visualization that is useful to Dr. Llama.

C7: Astronomy Tool Login

A login would allow each user to have data that they “own,” as well as manage who is using each object in the system. It will need a slot in our database as well as a user interface to manage user input.

Demonstrations:

In this section, we outline the demonstrations we have prepared and exactly which of the challenge(s) each one of them provides a solution to.

1. **Basic GUI with operation fields and buttons**

   Challenges addressed:

   - C1: Operational GUI

   Flight Plan:

   1. Input desired exposure time in dedicated field
   2. Input desired number of exposures in dedicated field
   3. Click the point button to simulate pointing the device
   4. Click the submit button to simulate initiating observation

2. **Messaging Server: Back and Forth**

   Challenges addressed:

   - C2: Backend Messaging

   Flight Plan:

   1. Click button sending data to one of the “subsystems”
   2. Demo data will show on subsystem, and “do work”
   3. Finally, a button will be clicked to send the response from the “subsystem” to our messaging server

3. **Database: Access and Storage**

   Challenges addressed:

   - C3: Database Access

   Flight Plan:

   1. Click the button to get the specified object’s data from the database
   2. Open database to show information arrived
   3. A button is shown and is clicked to show the data of the specified object

Other challenges recognized but not addressed by demo:

- **C4: Automatic Celestial Object Finding**

  While employing this utility in our web interface is a goal for the minimum viable product, it is not incredibly difficult to produce, as, in essence, it is only plugging in an already-existing library (called astroquery). Thus, we did not feel that this was challenging enough to produce a demonstration.

- **C5: File Writing**

  To mitigate the risks associated with overcoming this technological challenge, our team will produce a module that takes in an agreed upon data format and produces FITS files for our client, as a proof of concept, at the beginning of the next semester.

- **C6: Data Representation**

  This is a stretch goal, so it is not necessary for our mvp. However, we are mentioning it as it is a goal that we want to achieve as well as to keep in mind to continue to research.

- **C7: Astronomy Tool Login**

  The main reason this will not be implemented now as a demo is that it is close to first in implementation, and it is not scheduled to be very difficult. Thus we will know if there are problems, and can solve them early on in development.