# Campanile Time Server: Chronologic Support for the S.E.R.F.

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Abstract

The Campanile Time Server was created as a way to create a high-reliability, accurate time source for the James S. Markiewicz Solar Energy Research Facility at Valparaiso University. Prior methods were not consistent or reliable enough for research use and for proper function of the facility. This project seeks to fix that by designing a software suite that leverages existing time information in a form compatible with the operational considerations of the facility. This software utilizes Go and Python, in files that connect to produce informative outputs on a display. These languages were chosen for their superior library support in web and GPIO interfacing. The project requirements necessitated a suitably robust case containing multiple Raspberry Pis that can interface with the software suite and provide failover redundancy. The group chose Raspberry Pis due to the global supply chain limiting hardware options. Additionally, other products did not have the variety of hardware accessories. The software components include a conversion script from clock time to solar time, scripts to parse data from the hardware devices, and a basic website to display time in the facility. The program files were complemented with unit test files to ensure valid results and continuous integration using Jenkins. The project proceeded with an Agile Development Method, as the team met regularly with their customer to discuss progress and receive feedback.
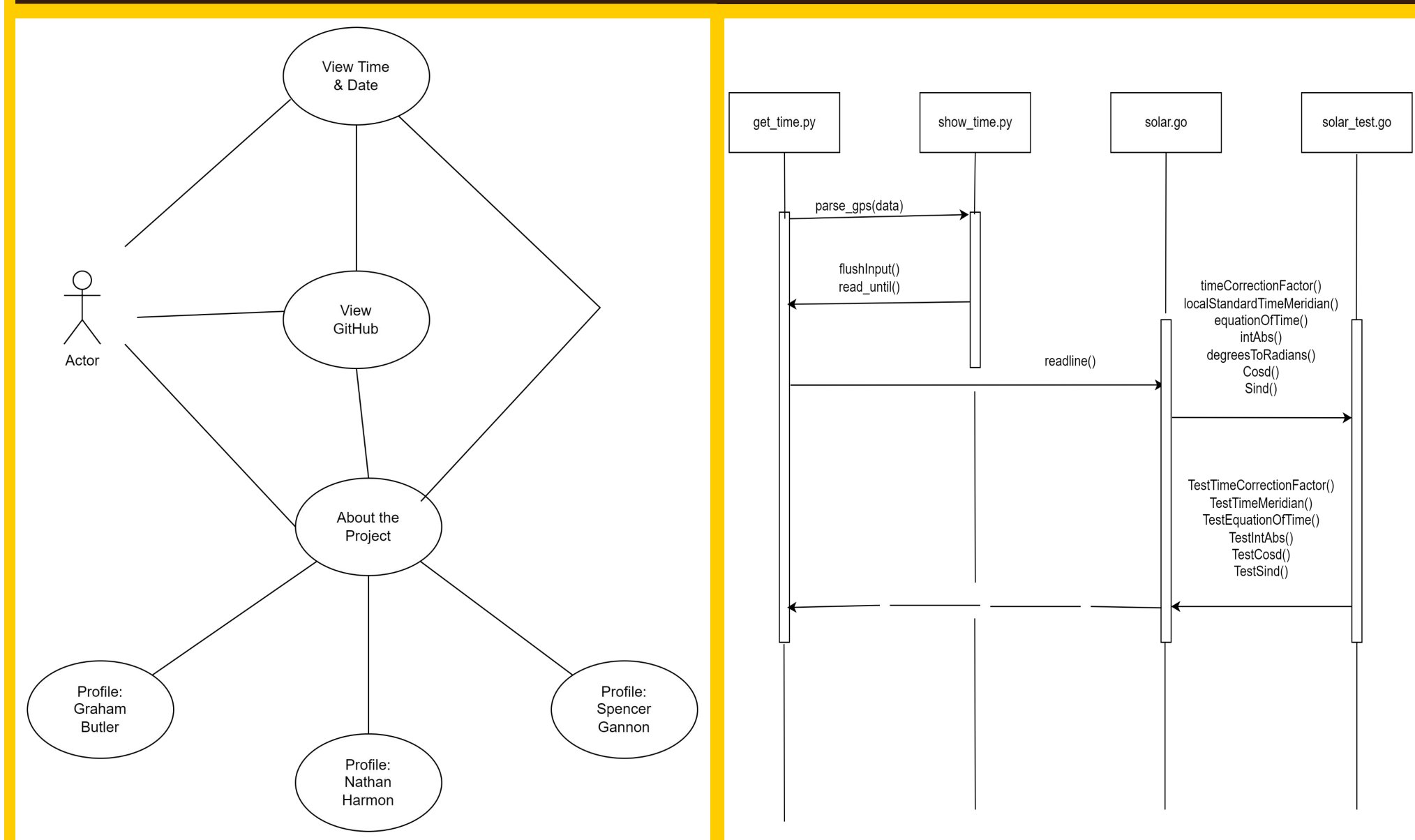
Preview of Clock
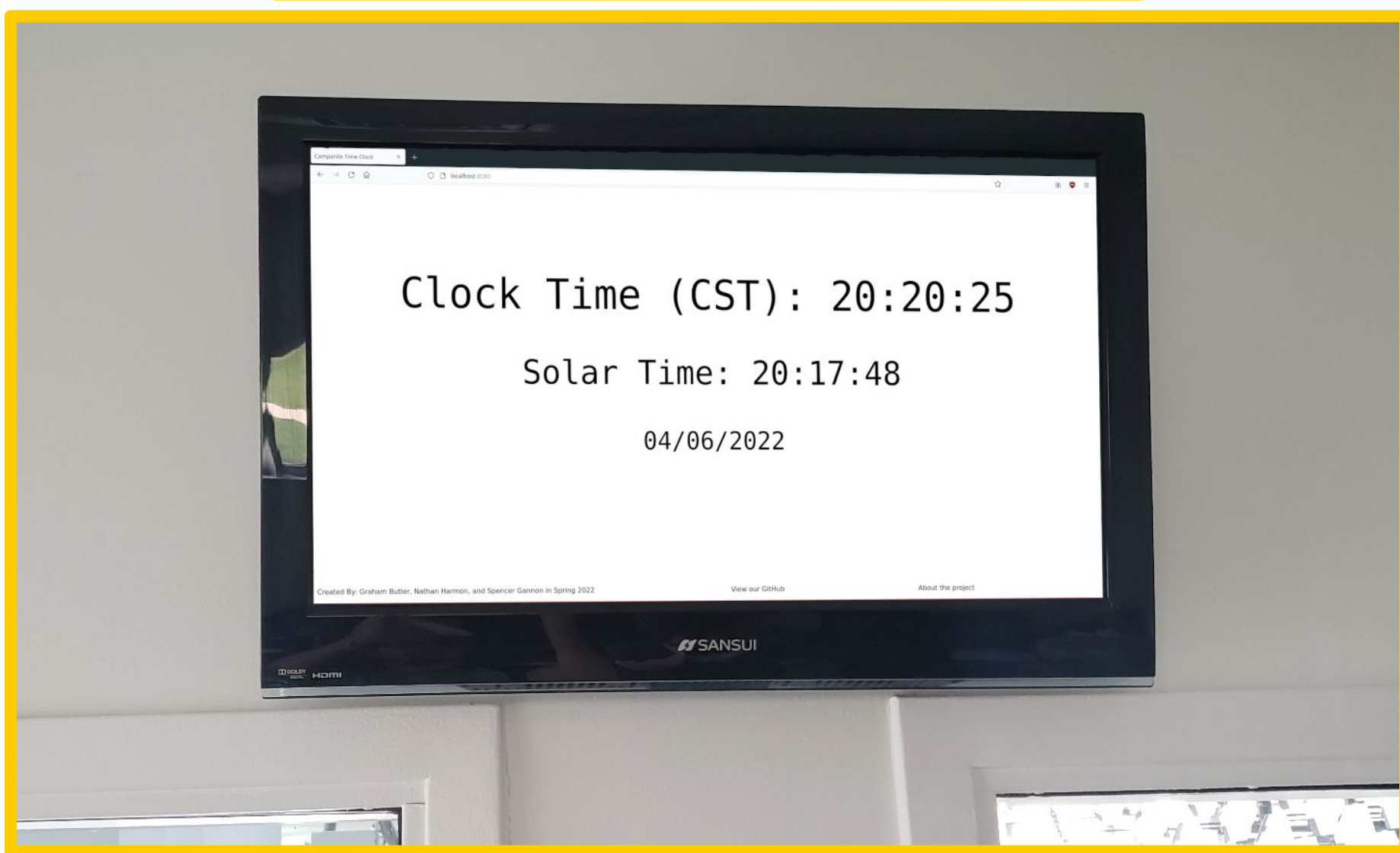
3D Model of Tower
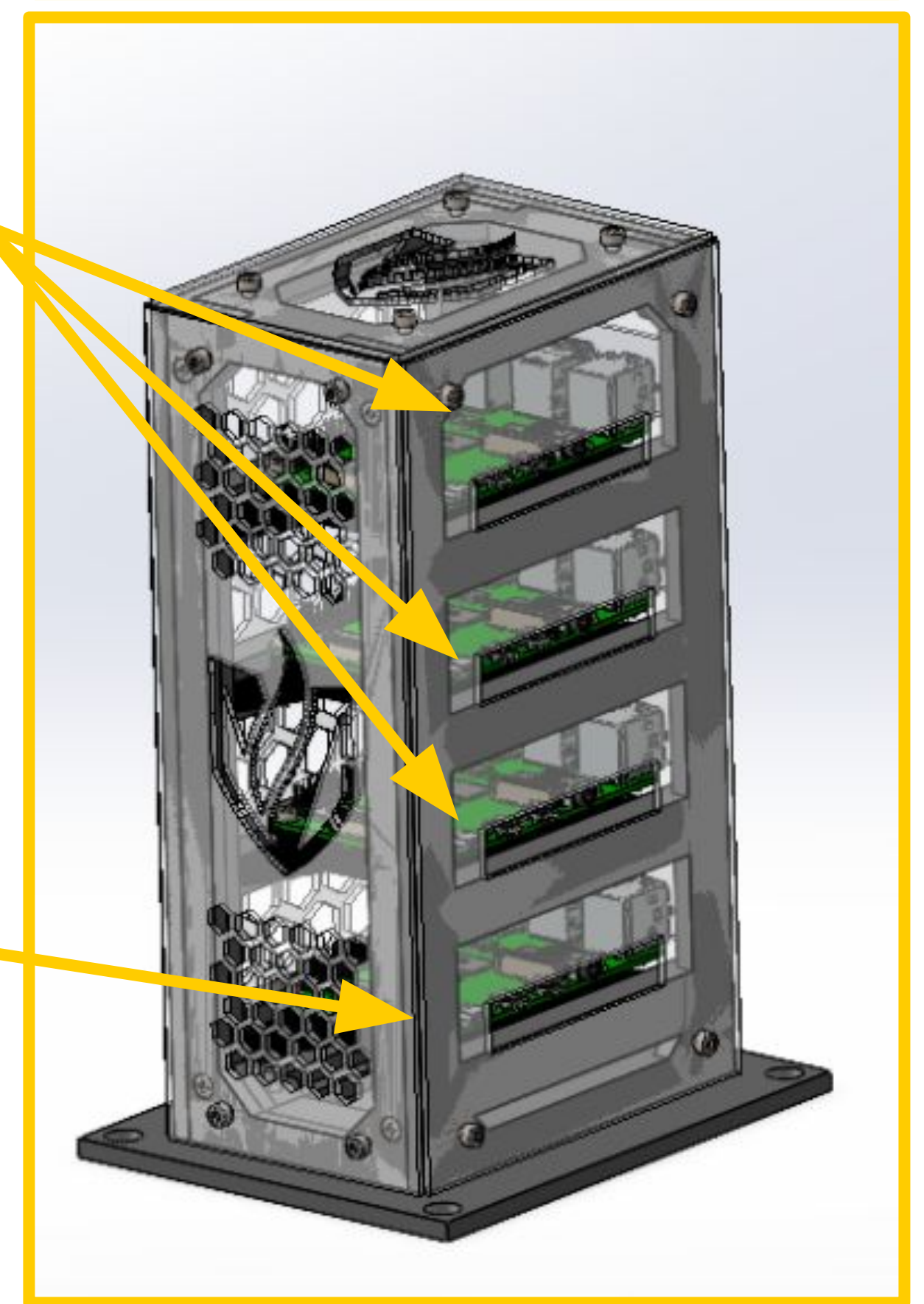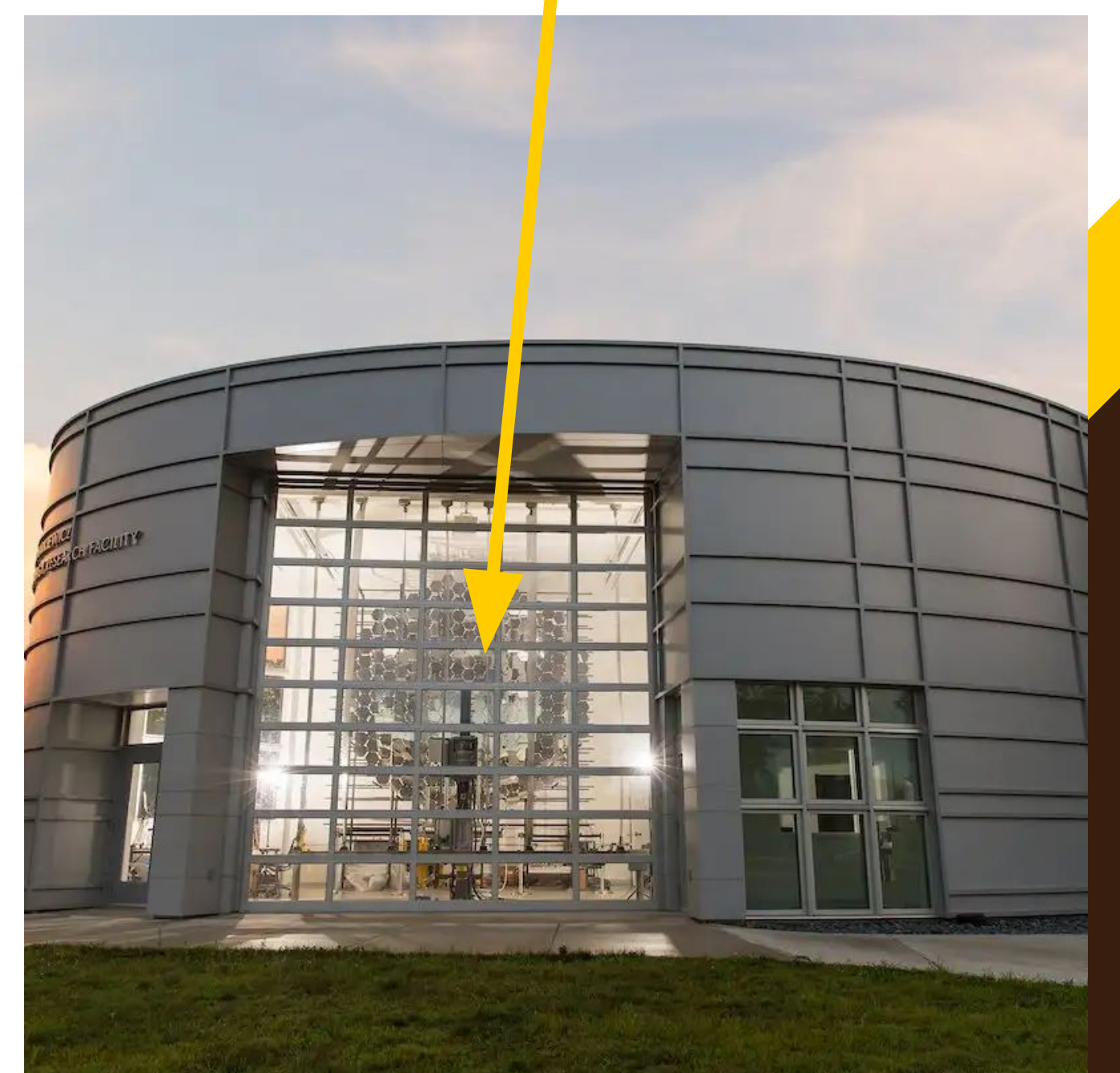

Time Source

NTP Server

UML
Web Page UI (Use Case)   Internals (Sequence)

Precision solar time supports this device

Tools Used:

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