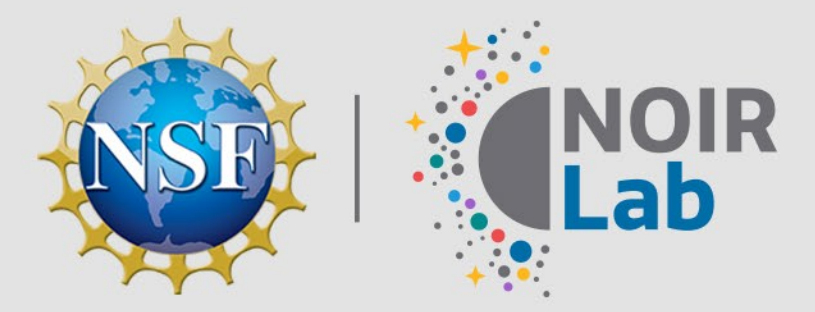


Augmented Reality at NOIRLab/Gemini – Site Monitoring at the fingertips

Paul Collins (Engineering Services/Gemini/NOIRLab)



What is it?

It is an augmented reality interface between our VTScada scada program and our engineers and technicians, via Aircada. **Real-time data can be seen on your cell phone or tablet.** The result is a tool that is literally at the fingertips of Gemini South's technicians, who can use mobile devices to inspect critical equipment, and see live data and alarm information superimposed over each connected device.



Why do you need it?

This gives us a very user-friendly interface that allows anyone using the app to see an augmented reality platform that can be used on a daily basis by our engineers and technicians to monitor our critical equipment. Our goal is to eliminate the old clipboard that was previously used for our daily systems checks. With a single glance, a technician can see the average, the minimum and the maximum data over a specific time scale, from an hour up to 5 years.

When the app is opened, notifications for other technicians can easily be added in real time for the use of scheduling maintenance tasks and alerts.



How was it made?

In 2018 Gemini created a sophisticated application in VTScada – an equipment monitoring and controlling software – that allows for quick and easy access to the health and status of critical systems at Gemini South. With this application teams can monitor the observatory's critical systems remotely, which is crucial when trips up the mountain from La Serena aren't possible because of inclement weather.

In early 2022, after years of fruitless searching for AR software that could be integrated into a VTScada application, a small startup company named Aircada was discovered. Aircada builds industrial AR software and interfaces. Gemini reached out to brothers and co-founders Sean and Wylie Chenoweth and invited them to work on a prototype application that would project the VTScada data in augmented reality. At this point, Aircada was still in its infant phase and had not yet acquired clients, so the brothers were excited to work with Gemini as their first official customer.

Aircada's technology polls the VTScada database using the included REST interface where SQL queries are placed, and the results are returned in paginated JSON format.

Since January of 2022 Gemini South Telescope has been working with Aircada and VTScada to develop a prototype augmented reality platform that can be used on a daily basis.

Aircada uses Microsoft's Azure Spatial Anchors as the backbone of its augmented reality localization system, whereby users can scan an area and accurately locate virtual 3D content in real-world space.

How does this pave the way for other telescopes/Programs?

Aircada's AR prototype significantly increases accessibility and hence the efficiency of monitoring Gemini South's critical systems. By pulling data from the VTScada platform, visuals such as graphs, charts, and meters can be superimposed directly above the equipment. The AR interface can display information about the state of coolant pumps, electrical systems, the uninterruptible power supply for the computer room, helium compressors, and many other important items. This allows the engineering and electrical teams to know the status of these complex systems in real time simply by pointing their phones at the equipment.

Another innovative feature that Aircada has implemented is the ability to submit and track the status of work orders directly from the AR interface. Information pertaining to work orders, such as who it has been assigned to and the deadline by which it must be completed, is clearly displayed right above the equipment and is at the fingertips of everyone on the engineering and electrical teams.

Engineering Services is moving forward to implement the prototype as a working tool available to Gemini South and to keep working to make powerful tools such as VTScada and Aircada available to other Programs.