Brazilian Tunable Filter Imager (BTFI) Conceptual Design Review (CoDR)

Control System Software

Version 1.2

USP-IAG Universidade de São Paulo

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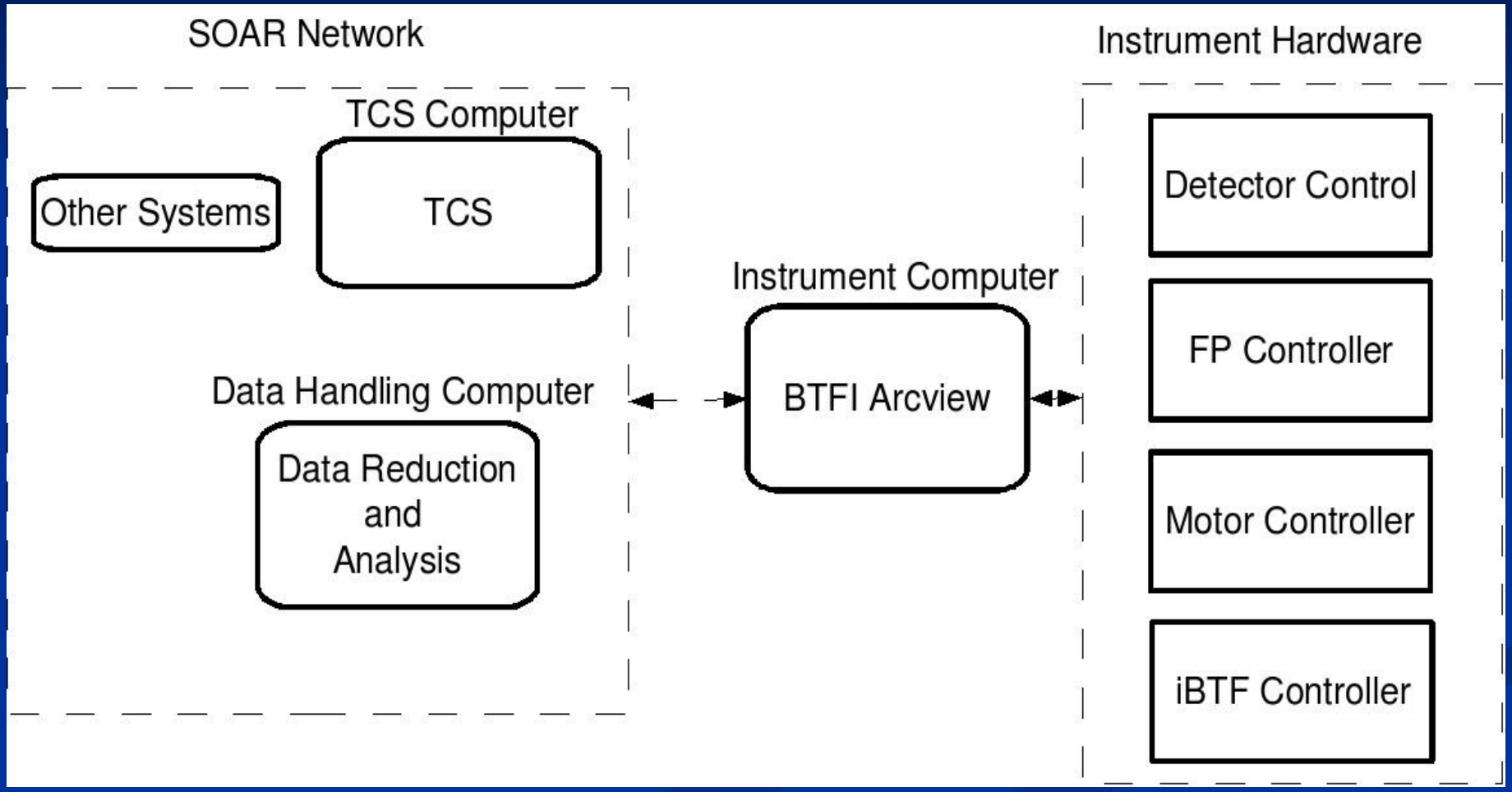
A quick view


SOAR Network
Instrument Hardware
TCS Computer
Other Systems
TCS
Instrument Computer
Detector Control
FP Controller
Data Handling Computer
BTFI Arcview
Motor Controller
Data Reduction and Analysis
iBTF Controller

Description

- For a reliable control of the instrument, we need to project a robust Instrument Control System

Users of the system

- The users of the BTFI ICS can be classified in the following categories:
  - Observer
  - Telescope Operator
  - Technician
  - Engineer
  - Developer

Requirements

Basic Requirements

- The ICS needs to connect with TCS - the software needs to be able to send and receive commands
- A graphical interface is desired (for control, setup and select the mode of operation, view in real-time the data and monitor the system status)
- The SOAR "standard" requires that the software of the instruments to be in Labview

Requirements
Data Specifications

- The result of a observation is a 3D data cube.
- The format of data transport will be FITS
- On the FITS header will be written everything about the observation such as coordinates x, y and time tag, date, name of the object, number of channels, scanning wavelength, etc.

Requirements

Graphical Interface

- During a observation, the graphical interface should be keep as simplest possible and with the necessary information.
- What is necessary?
  - everything that shows the instrument status
  - all the important operations available to the observer such as selection of the L3CCD mode operation, picture parameters, buttons, etc.

Requirements
ICS Modes of operation

- Observation level – when the instrument is running a observation
- Calibration level – high level commands to allow iterative process for acquiring calibration data cubes and adjusting iBTF and FP parameters
- Maintenance and Engineering level – low-level access to the system, to make diagnostics and maintenance, and send low-level commands
- Testing level – lowest level of operation, to install and deinstall of subsystems, change of the components, deep diagnostics and calibration

ArcVIEW

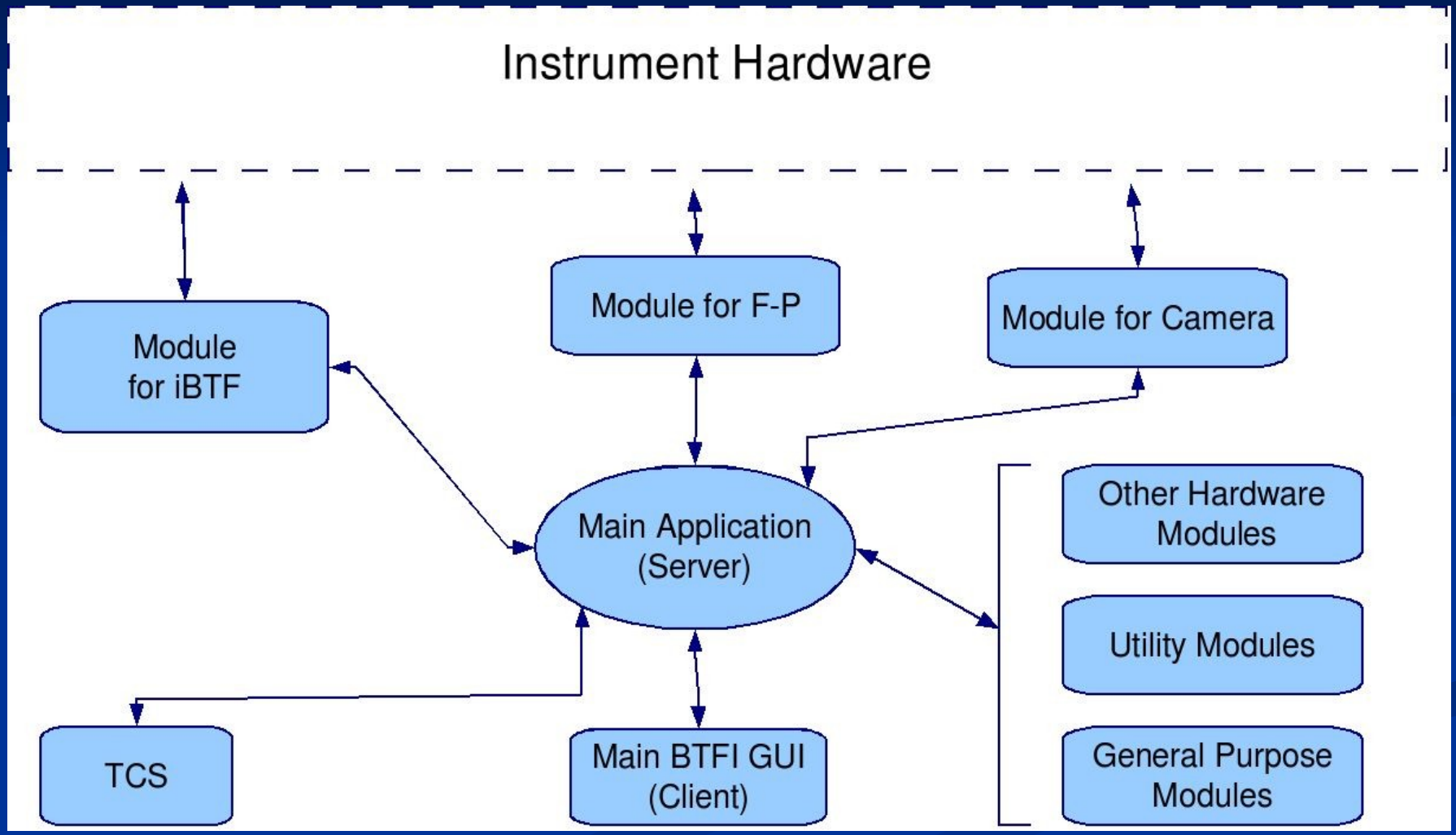
What is it?

- ArcVIEW is a system control software developed by CTIO and SOAR for handling CCD controllers, based on Labview

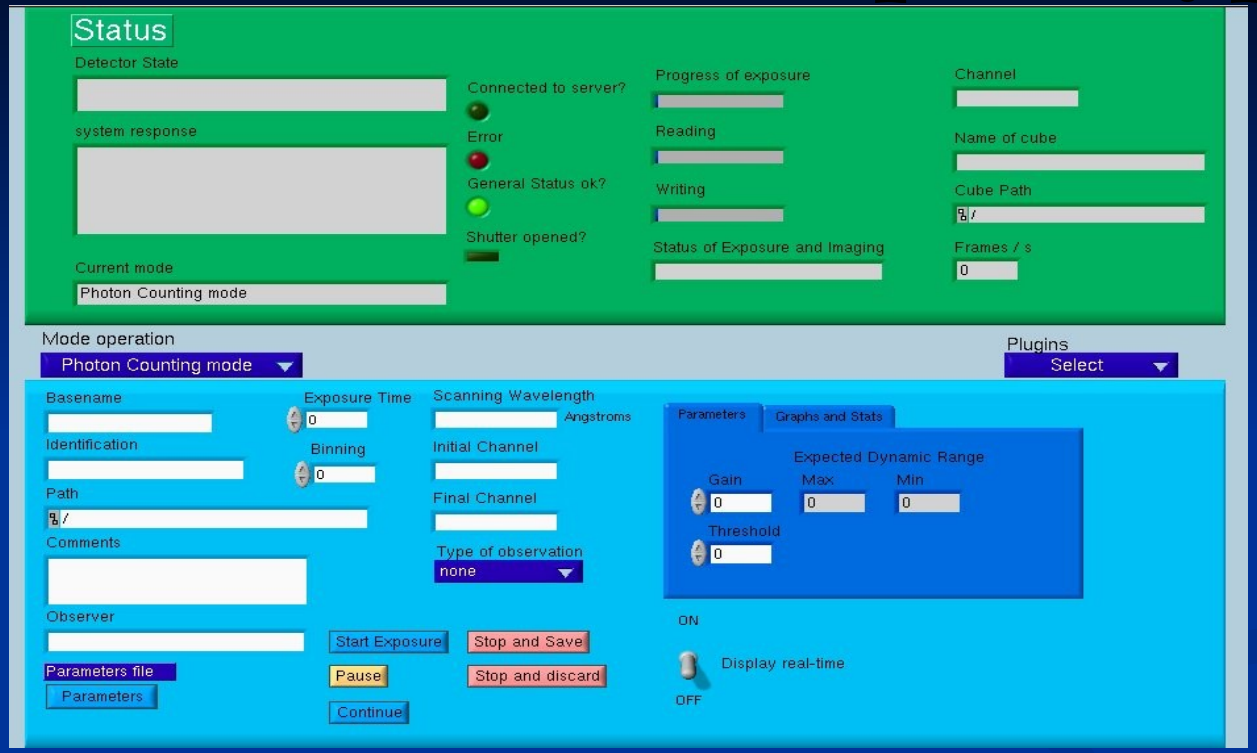
Why use it?

- It has the following characteristics:
  - It is capable of communicating with TCS
  - Many components are reusable (don't need to "re-invent the wheel")
  - Other instruments at SOAR use Arcview (Spartan, SOI)

Basic software architecture



A basic prototype



fake dark image

- The observer graphical interface can produce 2D images in the gain unity mode
- The server can receives commands from the client and send them on to the correct module

Next steps

Finish the prototype

- Make the simulator of the missing modules working
  - Get a "dummy" L3CCD (to exercise the special characteristics of the EMCCD controller)
  - Get a "dummy" Fabry-Perot and iBTF (same reason as above)
  - Generate data cubes (3D images)
  - Create the technical/engineer interfaces