ANDES: NOAO's Observatory Database System

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Abstract. ANDES (the Advanced NOAO Database Expert System) is NOAO's new observing proposal system. Recent improvements include the phase out of legacy components, such as our previous Access-based effort called ALPS++. New work focuses on pre and post-TAC procedures such as importation, scheduling, collection of observing reports on the mountain, and automatic compilation of various statistics. The ultimate goal is to provide an environment which allows a comprehensive understanding of the collection, evaluation, scheduling, execution and post-execution of proposals and programs.

1.   Introduction

With the introduction of NOAO's new observing proposal system, ANDES (the Advanced NOAO Database Expert System), it has become easier to track a proposal from conception to execution–an approach that is often called end-to-end (e2e) in the jargon of the business sector. We give a brief description of some of the steps involved in this process at the NOAO, and explain our approach.

2.   Proposal Import

Investigators can create a NOAO proposal in a number of ways, but they all boil down to the construction of a LaTeX file either through the use of a web form, e-mail template, or submission of an XML file. This LaTeX file is then parsed via a Perl script into a more structured format that is suitable for ingest into the database system (Bell, Barnes & Pilachowski 1998).

We require that every proposal be scrutinized by a person upon import to ensure the integrity of the data. In particular, it is crucial that investigator attributes such as name, e-mail, institution and address are carefully looked at since we maintain a master list of such information. Figure 1 demonstrates part of the web interface that allows our importers to do this. Highlighted cells represent a mismatch between the information we already have on file about a certain investigator, and the information which they have given us in the current proposal. It is up to the importer to decide what, if any, changes need to be made in such a situation. Run information is handled in an analogous manner.
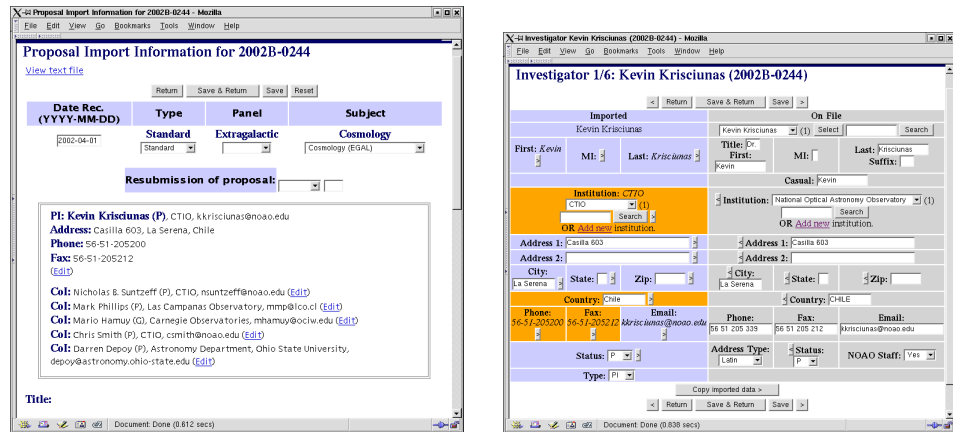
Figure 1.   *Left*. From this page, most proposal attributes are available for perusal by importers. In particular, it is required that each investigator and run is looked at in order to ensure mistakes and duplication are kept to a minimum. *Right*. If an investigator is already in our database (because they have proposed in previous semesters), that information is displayed in the "On File" column, and can be compared and updated to reflect any changes. At least the name and e-mail address must be defined before the page will allow editing of the next investigator.

3.   Time Allocation

Twice a year the NOAO's time allocation committees meet and decide how to apportion telescope resources for the coming semester. This process is discussed in more detail in Bell, Gasson & Hartman (2002) and Gasson & Bell (2003).

4.   Scheduling

Once proposals have been submitted, imported, and eventually graded and ranked by time allocation committees, NOAO schedulers can begin their job. In order to facilitate this process, we provide a simple, but effective, web interface (see Figure 2) for entry of scheduling information. We also dynamically generate a list of ranked proposals that uses color coding to draw attention to possible discrepancies. For instance, if a proposal has been scheduled in time that is brighter than requested, or in a month outside the optimal or acceptable date ranges specified on the proposal, the corresponding cell is colored. It is, again, entirely up to the scheduler to decide what, if anything, they will do to address these issues.

5.   Telescope Log Forms

Tracking exactly what happens at the telescope at observing time is an essential part of the night-to-night operation of the observatory. In conjunction with

Figure 2.   *Left.* The schedule is edited on a month-by-month basis. Contiguous blocks of runs are color coded, and instrument changes are bolded. Clicking on a proposal number brings up more in-depth proposal information, including any relevant scheduling constraints or TAC comments. *Right.* The schedule checker compares what observers asked for to what they were actually scheduled. For instance, if a run has been scheduled for a time when the moon is brighter than was requested, or in a month outside the specified optimal or acceptable ranges, the cell is colored.

many other pieces of software on the mountain, authorized staff members can get an idea of the behaviour of the telescope from the point of view of the observer via the electronic observing/telescope log form (Figure 3).

At the end of each night, the observer fills out this form (identified by their proposal number), and specifies how much time has been lost to such things as weather and other technical problems. Support staff may then visit the log form viewer, fix mistakes (many of which are automatically flagged by the software), and view summary statistics over an arbitrary length of time.

6.   Reports and Statistics

One difficulty associated with our move away from ALPS++ and Microsoft Access to ANDES has been creating paper reports. Many reports can be effectively moved to the web, and made more useful in the process (this is particularly true for some kinds of statistics which change often) but there are some for which it is either preferable or required to present them on paper. We employ a couple of strategies in this situation.

The first, and simplest, is to write a script which produces a comma-delimited file. This works well for data that is essentially tabular in nature, and likely to be further processed by support staff. An example would be many of the quarterly or annual reports the NSF requests.

The second solution, used in situations where more formatting is needed, is to programmatically fill in LaTeX templates. This requires a good deal more effort up front, but has proven to be quite effective. We often use this approach to create professional looking reports in near real time during the TAC process.

Figure 3.   *Left*. This page uses the current date and time to guess which program is likely to have taken place, and displays any relevant information (i.e., proposal number, investigators, title). This information can be overruled if it is found to be wrong due to changing conditions. *Right*. Observing statistics can be viewed by staff and used to form a picture of the behaviour of the telescope over a period of time. In addition, if there are any discrepancies between the content of the log, and what is expected (a different instrument was used than was recorded on the schedule, for instance), a note is displayed.

References

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