Autoguide PANORAMIX

From the optical path of the telescope, the image of the star field containing the observed object - or another object to be used as a guide star - is taken from an intensified TV camera ( described here in detail
).

The signal is processed by a digitizing board (PCI 1409 by National Instruments) that, from the TV image, generates an array of 800x600 pixels with a 10-bit sampling. These values are match the characteristics of the TV cameras (625 lines per 800 points) with a signal-to-noise ratio better than 300 (~50dB).

The rate of frame acquisition is of about 3 Hz (3 frames/second). It is possible to select a star, in the camera field of view, to be used for guiding the telescope. The control software (PANORAMIX) has been developed in Lab View environment, exploiting its powerful graphic libraries (IMAQ).

Running PANORAMIX, the user will see the digitized image of the field of view of the TV camera.

From each image, a square region defined by the user can be selected and its centroid is

evaluated. The center of the selected region, marked by a green cross-hair, can be moved by the user. The coordinates of the centroid of the square sub-array are continuously compared to those of the cross-hair and any significant difference (over an adjustable threshold) activates the telescope control system.
 In other words, the telescope is moved in order to cancel the differences of coordinates from centroid and cross-hair.

The dimension         of the squared ROI (region of interest) is set by the user.
 Also the gain of the camera and the mode of signal processing (linear, logarithmic, square-root, quadratic) can be set by the user.
 The graphic librariers of Lab View allow us also to have, in real time, the plot of the cross-section of the seeing disc of the star enclosed in the ROI and to evaluate its FWHM (full width at half maximum) that is simply related to the "dome" seeing.

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