International Symposium

Astronomical Surveys and Big Data 2 (ASBD-2)

BYURAKAN ASTROPHYSICAL OBSERVATORY,

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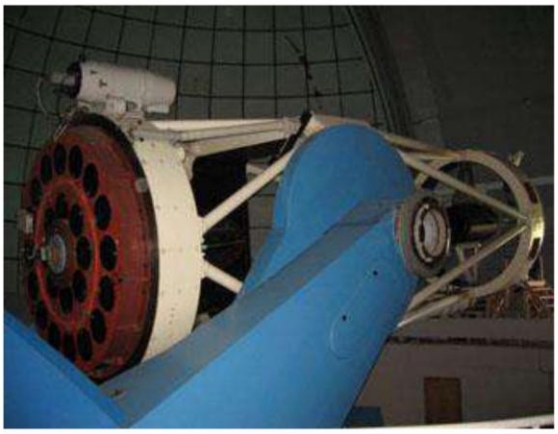
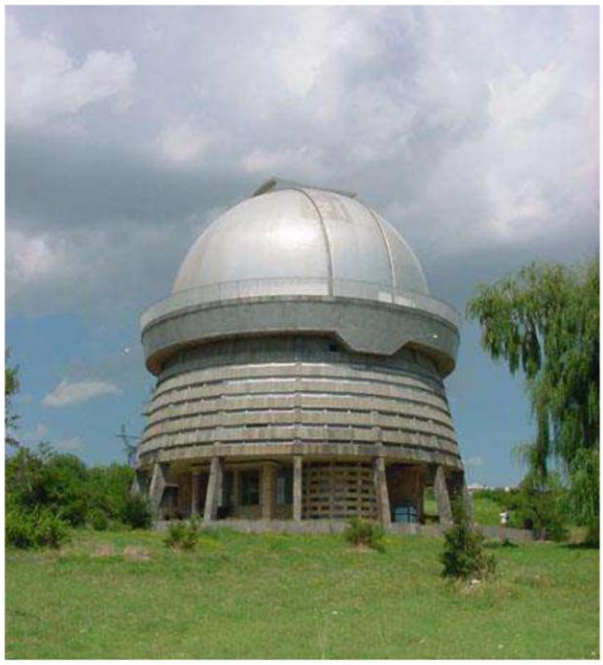


ABSTRACT BOOK



My paper starts with the question many of us wonder 'What if an Asteroid hit Earth?' The answer depends on how big an asteroid is in terms of dimension- Let's say an asteroid of baseball ground hits earth, which can completely erase a busy city. Most of the asteroids are detected by Satellites, Probes and telescopes with large aperture length. Mostly large Telescopes from the earth are used for tracking main belt asteroid but what if it gets out of sight from researchers or Scientists; it might take away people's life. In this paper, I introduced machine learning to detect the asteroid with more than 60 percent of efficiency. The famous Scientist Stephen Hawking wrote in his last book that 'Asteroids are great threatened to the planets'. Machine learning is one of the best predictive methods without explicitly giving any external command. This paper is published in national conference in the Machine learning journal, which is awarded as the winner of that conference. I attempt to use machine learning in the replacement of Astrometrica software with Pan-Starr Telescope real-time Fits file data which is located in Hawaii, USA, Now I wrote another in continuation of my previous paper, where I am able to achieve more than previous work taking Gaussian graph in consideration. Always there may not be a possibility of recognizing the asteroid with the human eye but machine learning with good test code can actually ease the detection with more efficiency. Machine learning can be implemented with many softwares like R, JavaScript but I choose Python with pandas, nunpy, matpy libraries with one more important astronomical library 'astropy' to work on fits file. Anaconda with python 3.7.1 version jupyter notebook, I obtained the same result as Astrometrica report.

26. Catalogs of celestial bodies from digitized photographic plates of the Ukrainian Virtual Observatory Archive

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The Ukrainian Virtual Observatory (UkrVO) database is compiled from observations conducted in 1898-2011 at observational sites of 8 Ukrainian observatories with about 50 instruments. Now the UkrVO archive covers about 40,000 astroplates, from which 15,000 are digitized at three observatories: Main Astronomical Observatory of the NAS of Ukraine (MAO NASU), Mykolaiv Astronomical Observatory, and Astronomical Observatory of the Taras Shevchenko National University of Kyiv (http://gua.db.ukr-vo.org). The digitizing of astroplates has been performed using EpsonTM and MicrotekTM commercial scanners with 16-bit gray levels and resolution of 1200 dpi. Digitized images are stored in TIFF and FITS formats. Images of all objects registered on plates were processed using the advanced software complex for CCD images processing MIDAS/ROMAFOT in the LINUX environment. Additional software modules developed and implemented at the MAO NASU provide both the digitized images processing and the final products as the catalogues of positions and stellar magnitudes of all the registered objects. Also, the UkrVO archive contains about 50,000 spectra astronegatives obtained in 1960-1995, mostly with variable stars. Their classification and systematization are in progress. The processing of the

digitized Northern Sky Survey (FON project) observations resulted in a few catalogues of coordinates and B-magnitudes for more than 19 million stars and galaxies from the FON-Kyiv part and more than 13 million stars and galaxies from the FON-Kitab part. Besides, based on these data, two catalogs for more than 5,000 positions and B-magnitudes of asteroids were compiled. Now, in cooperation with Gissar Astronomical Observatory (Dushanbe, Tajikistan), we prepare similar catalogs based on the digitized observations of the third part (1985-1992) of the FON project. The digitized data on the open star clusters in UBVR color bands obtained at the Baldone observatory (Latvia) were used to enhance the FON project. The developed methods of the digitization, image processing, and plate reduction with the latest catalogues as a reference, allowed us to achieve the maximum accuracy of coordinates and magnitudes of objects available for this photographic material (for example, the mean internal errors of the FON-Kyiv catalog are $\sigma RA,DEC = 0.23''$ and $\sigma B = 0.14m$ for all objects up to 16^m5). Other digitized data of photographic observations stored in UkrVO archives formed the basis of several Solar System Bodies positional catalogs. The compiled catalogs of 90 positions and B-values of Pluto, 1500 positions of satellites of Saturn, Jupiter, Uranus, and Neptune are available on the UkrVO website at http://ukr-vo.org and in the Strasbourg Data Center (ftp://cdsarc.u-strasbg.fr/pub/cats). Images of optical analogs of gamma-ray burst sources GRB110213A and GRB101224A were identified using digitized photographic plates of the UkrVO. Catalogs of coordinates and magnitudes for all the fixed faint objects around GRB110213A and GRB101224A were also conducted. For these and other gamma-ray burst sources, the results are being published in GCN Circulars Archive.

27. Machine Learning techniques for binary morphological classification of SDSS-galaxies and their problem point

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We studied the effectiveness of the Machine Learning techniques for binary morphological classification of SDSS-galaxies into early (E) and late (L) types. The target sample contained 316031 galaxies from the DR9 with a redshift z

28. Detecting Transient and Variable Sources Without Temporal Information

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Certificate of Attendance

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We proudly confirm that Yuri PROTSYUK attended the online International Conference ***"Astronomical Surveys and Big Data 2 (ASBD-2)"***, which is organized by the Byurakan Astrophysical Observatory, Byurakan, Armenia, 14-18 September 2020. He has presented the following contribution at the conference: *"Catalogs of celestial bodies from digitized photographic plates of the Ukrainian Virtual Observatory Archive*" (oral presentation).

Dr. Areg MICKAELIAN
ASBD2 Chair, SOC