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Title:

The NASA Tournament Laboratory ("NTL"): Improving Data Access at PDS while Spreading Joy and Engaging Students through 16 Micro-Contests

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Abstract:

NASA PDS hosts terabytes of valuable data from hundreds of data sources and spans decades of research. Data is stored on flat-file systems regulated through careful meta dictionaries. PDS's data is available to the public through its website which supports data searches through drill-down navigation. While the system returns data quickly, result sets in response to identical input differ depending on the drill-down path a user follows. To correct this issue, to allow custom searching, and to improve general accessibility, PDS sought to create a new data structure and API, and to use them to build applications that are a joy to use and showcase the value of the data to students, teachers and citizens. PDS engaged TopCoder and Harvard Business School through the NTL to pursue these objectives in a pilot effort. Scope was limited to Small Bodies Node data. NTL analyzed data, proposed a solution, and implemented it through a series of micro-contests. Contest focused on different segments of the problem; conceptualization, architectural design, implementation, testing, etc. To demonstrate the utility of the completed solution, NTL developed web-based and mobile applications that can compare targets, regardless of mission. To further explore the potential of the solution NTL hosted "Mash-up" challenges that integrated the API with other publically available assets, to produce consumer and teaching applications, including an Augmented Reality iPad tool. Two contests were also posted to middle and high school students via the NoNameSite.com platform, and as a result of these contests, PDS/SBN has initiated a Facebook program. These contests defined and implemented a data warehouse with the necessary migration tools to transform legacy data, produced a public web interface for the new search, developed a public API, and produced four mobile applications that we expect to appeal to users both within and without the academic community.

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