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Results of the Asteroid Data Hunter algorithm challenge

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ABSTRACT

We present the results from the Asteroid Data Hunter algorithm competition, part of the Asteroid Grand Challenge. Asteroid Data Hunter is the result of a Space Act Agreement between Planetary Resources and NASA to find a crowd sourced solution related to asteroid detection, tracking, and characterization. With archival data from the Catalina Sky Survey, competitors from around the world created an extremely sensitive asteroid detection algorithm using modern machine learning techniques. The work is motivated by the vast amount of data available now flowing from modern instruments, as we are rapidly approaching the point where is no way for professional astronomers to verify every detection. In the future, surveys for small bodies will generate ever more data, the ability to autonomously and rapidly check the images and determine which objects are suitable for follow up will be crucial. Modern machine learning techniques allow efficient manipulation and sorting of the data, decreasing the computational requirements of the program. The decrease in computer power required could enable these algorithms on space based platforms. The final product has been released under an Apache 2 license and is freely available to those interesting in incorporating the algorithms in their pipeline.

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