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Evaluation of spatial distribution of craters on lunar surface for detection of secondary craters.

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Secondary craters are impact craters formed by ejecta that were thrown out of a primary crater. Secondary craters give a biased spatial distribution of craters. Researchers extract craters excluding a surface that contains secondary craters from lunar image based on his or her subjective views.

The purpose of this research is to develop an algorithm for evaluating spatial distribution of craters on lunar images. The algorithm applies to ideal spatial distribution of craters and real spatial distribution of craters, and evaluates whether a non-random portion in real area by comparing a single-linkage hierarchical clustering parameter.

We demonstrated for two regions on Mare Crisium. As a result of visual inspection, one region contains a lot of clustered secondary craters, and another region contains few clustered secondary craters. The clustered secondary craters could be evaluated non-random spatial distribution of craters quantitatively by our clustering analysis.

Keywords: moon, secondary crater, spatial distribution, clustering analysis