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## Automatic surface age dating of impact events on Mars

Counting impact craters on surfaces of terrestrial bodies is currently the only way to estimate the age of a planetary surface and the duration of geological processes occurred in the past. This approach requires a tedious mapping and morphological inspection of a large number of impact craters. We created a Crater Detection Algorithm trained on Martian orbital imagery in order to compile all small impact craters on the Martian surface down to around 100m in diameter. We applied our algorithm on the CTX mosaic (6m/px) between 45 degrees of North and South covering more than 70% of the entire Martian surface, and detected around 17M of impact structures >50m. From these detection, we are now able to obtain an estimation of the age of any geological structures having shaped the surface of Mars at different spatial scales. We primarily focused on impact event dating. Results on the estimation of the age of ~200 impact craters formed during the Amazonian and Hesperian period (<3.5 Ga), will be presented. A spatial analysis of the distribution of impact craters detected on their blanket will be also introduced in the aim to distinguish primary impact crater population from secondaries. Finally, an analysis of the age distribution of these impacts will allow us to estimate the impact flux on Mars.

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