U14a   Investigation of the HSC unrecognized blends with machine learning

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A serious issue in astronomical imaging surveys is blending, the phenomenon of apparent source image overlap. When a blend image is considered as a single object, it is referred as unrecognized. Leveraging the Hubble Space Telescope observations, we suspect that a significant fraction of the COSMOS field sources in the Hyper Suprime Cam (HSC) survey are unrecognized blends. Though, their identification remains challenging and their impact on important cosmological probes such as source shapes and photometric redshifts is not totally unveiled. In this work, we extend the GalSim COSMOS data set (Mandelbaum et al., 2012) and use it within the LSST DESC BlendingToolKit software to simulate realistic HSC multiband blend images. Thanks to this new data set, we are able to train a machine learning blend identifier based on Convolutional Neural Networks (CNNs). We show that it can achieve better blend identification performance than that of the HSC pipelines (Bosch et al., 2017) and propose an analysis of the impact of the blend configuration on the accuracy of the CNN and the HSC pipelines.