Hydrology and Earth System Sciences

Discussions

HESSD

Interactive
comment

Interactive comment on "GRAINet: Mapping grain size distributions in river beds from UAV images with convolutional neural networks" *by* Nico Lang et al.

Nico Lang et al.

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We are glad that the reviewer finds our work relevant for the HESS journal in terms of scientific significance and quality. Thank you for reviewing our paper and pointing out the technical corrections. We will consider these in our revised version.

Regarding your open question:

"Why this preprocessing step was necessary since PhotoScan enables user to set the specific spatial resolution when producing orthophotos?"

You are right, we could have fixed the resolution when generating the orthophotos. In

fact the ground sampling distance (GSD) of all orthophotos is not far from 0.25 cm. We preferred to keep the best possible GSD to support the manual data annotation, then resample to exactly 0.25 cm for the CNN. We see this as a minor technical detail.

Either way, a uniform resampling for the automatic processing is beneficial, as it allows the CNN to implicitly learn the absolute scale, and consequently to predict the frequency of absolute, metric object sizes without any additional information about scale or resolution. Another advantage of (any) constant resolution is that it simplifies the learning task, since the visual features need not be scale-invariant (which in our application would be unnecessary and could even be a disadvantage, introducing scale ambiguities).

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2020-196, 2020.