



M.Sc. Topic

Systematical investigation of river substratum by an UAS
(unmanned aircraft systems)

Background

Unmanned aircraft systems (UAS), often also called drones, are meanwhile used for many different tasks, e.g. to investigate the extension of floods or to provide areal pictures of river systems.

In river engineering the geomorphology of rivers and associated gravel bars is of high importance, as this substratum governs for instance the reproduction of fish. However, as a result of the heterogeneity and the extension of gravel bars, a manual observation is time and labor intense. As drones are meanwhile equipped with high resolution cameras it is feasible to investigate these structures by obtaining pictures and videos. However, important information, such as grain size distribution is missing from pictures, even if high resolution pictures can be obtained.

Within this Master's thesis a systematical investigation of river substratum should be performed by UAS for given boundaries. The experiments will be conducted at the hydraulic laboratory in Stuttgart.

Content of the thesis:

1. Literature review on drones and their capability to investigate river substratum
2. Obtaining data sets for different boundaries, e.g., drone height, substratum composition, etc.
3. Post-processing by BASEGRAIN, developed at the ETH in Zurich and by Structure from Motion (SfM)
4. Comparison of drone investigations with standard methods
5. Developing guidelines for the in-situ use of UAS for investigating river substratum



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The thesis can be written in German or English. The results can also be incorporated in a conference article.

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Systematical
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substratum by UAS

