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Relative radiometric normalization for mosaicing of Thermal InfraRed (TIR) flight-lines acquired by Unmanned Aerial Vehicle (UAV).

Institut für Photogrammetrie
und GeoInformation

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Proposal for a Master thesis topic (EN)

Artuom Sledz

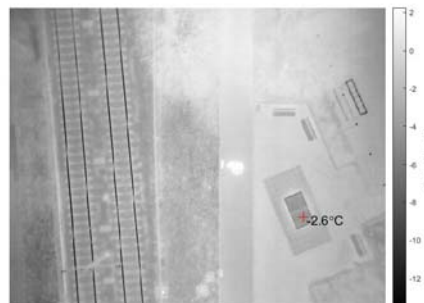
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Currently, flights to capture thermal aerial images are typically carried out using airplanes or helicopters. Thermal flights by airplane, in particular for small areas of interest are not economically feasible. In this context, the use of an Unmanned Aerial Vehicle (UAV) to capture thermal images is a promising solution. An UAV platform is characterized by high flexibility and low costs compared to thermal flights by a manned aircraft and delivers measurements with high temporal and spatial resolution. It is common for Thermal InfraRed (TIR) images that the Signal to Noise Ratio (SNR) and the contrast are low, making processing of TIR images difficult. To overcome low SNR issue a mechanical shutter is used for a Flat Field Correction (FFC). From other hand, TIR images are characterized by low count of texture feature. As an outcome, tie points between the images are hard to detect. To overcome such an issue the flight is planned with high vertical and horizontal overlap. As results of issues mentioned above, the same object may have different radiometric characterizes, resulting in decreased visible and radiometric agreement among the images composing the final mosaicked output.

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The main goal of this thesis is to evaluate and compare different approaches of relative radiometric normalization, like Histogram Matching and techniques based on Linear Regression. The performances of these techniques should be compared based on next criteria: visual assessment and statistical analysis. The student will be provided datasets containing thermal images captured by UAV.

This thesis will be supervised by Artuom Sledz, M.Sc.



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Orthophoto - temperature data

