

Introduction of A New Toolbox for Processing Digital Images From Multiple Camera Networks: FMIPROT

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Webcam networks intended for scientific monitoring of ecosystems is providing digital images and other environmental data for various studies. Also, other types of camera networks can also be used for scientific purposes, e.g. usage of traffic webcams for phenological studies, camera networks for ski tracks and avalanche monitoring over mountains for hydrological studies. To efficiently harness the potential of these camera networks, easy to use software which can obtain and handle images from different networks having different protocols and standards is necessary. For the analyses of the images from webcam networks, numerous software packages are freely available. These software packages have different strong features not only for analyzing but also post processing digital images. But specifically for the ease of use, applicability and scalability, a different set of features could be added. Thus, a more customized approach would be of high value, not only for analyzing images of comprehensive camera networks, but also considering the possibility to create operational data extraction and processing with an easy to use toolbox. At this paper, we introduce a new toolbox, entitled; Finnish Meteorological Institute Image PROcessing Tool (FMIPROT) which a customized approach is followed. FMIPROT has currently following features:

- straightforward installation,
- no software dependencies that require as extra installations,
- communication with multiple camera networks,
- automatic downloading and handling images,
- user friendly and simple user interface,
- data filtering,
- visualizing results on customizable plots,
- plugins; allows users to add their own algorithms.

Current image analyses in FMIPROT include “Color Fraction Extraction” and “Vegetation Indices”. The analysis of color fraction extraction is calculating the fractions of the colors in a region of interest, for red, green and blue colors along with brightness and luminance parameters. The analysis of vegetation indices is a collection of indices used in vegetation phenology and includes “Green Fraction” (green chromatic coordinate), “Green-Red Vegetation Index” and “Green Excess Index”. “Snow cover fraction” analysis which detects snow covered pixels in the images and georeference them on a geospatial plane to calculate the snow cover fraction is being implemented at the moment.

FMIPROT is being developed during the EU Life+ MONIMET project. Altogether we mounted 28 cameras at 14 different sites in Finland as MONIMET camera network.

In this paper, we will present details of FMIPROT and analysis results from MONIMET camera network. We will also discuss on future planned developments of FMIPROT.