

An automated image processing system for multiple camera networks

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Abstract

A system for multiple camera networks is proposed for continuous monitoring of ecosystems by processing image time series (webcam photographs). The system is introduced as a toolbox, Finnish Meteorological Image PROcessing Tool (FMIPROT), which includes data acquisition, processing and visualization from multiple camera networks. The toolbox has a user-friendly graphical user interface (GUI) which only minimal computer knowledge and skills are required to use it. Images from camera networks are acquired and handled automatically according to the common communication protocols, e.g. File Transfer Protocol (FTP). Processing features include GUI based selection of region of interest (ROI), automatic analysis chain, extraction of ROI based indices such as green fraction index (GF), red fraction index (RF), blue fraction index (BF), green-red vegetation index (GRVI), green excess (GEI) index as well as a custom color index defined by a user-provided mathematical formula. Analysis results are visualized on interactive plots both on the GUI and hyper-text markup language (HTML) reports. Importantly, the user can implement own developed algorithms to extract information from digital image series for any purpose. The toolbox can also be run in non-GUI mode, which allows running series of analyses in servers unattended and scheduled. The system is demonstrated using MONIMET camera network in Finland.