

Review comments on tc-2019-142 manuscript, entitled, "Towards a webcam-based snow cover monitoring network: methodology and evaluation".

General comments:

The tc-2019-142 manuscript, entitled, "Towards a webcam-based snow cover monitoring network: methodology and evaluation" presents a semi-automatic approach procedure to derive snow cover maps. The semi-automatic approach procedure is consist of (1) automatic image to image alignment and (2) automatic image to DEM registration which are the contributions of the manuscript. In addition a snow classification method (two existing methods in literature presented) and a manual user input (for estimation webcam's location) are needed for estimating snow cover from a webcam image.

The purpose of the work is clearly articulated and the methodology and results are adequately presented.

Specific Comments:

There are following issues which I believe need more discussions such as

(1) webcam-based snow cover monitoring network

(2) Arbitrary images to generate snow cover maps

(3) Most of existing studies use single cameras and thus are limited in areal coverage. In particular, they either require known camera parameters (i.e., extrinsic and intrinsic camera parameters such as the camera orientation or the FOV of the camera) or require significant manual user input (e.g., ground control points (GCPs)) to georectify terrestrial photography

(4) Since camera parameters are not readily available for public webcams, and manually setting GCPs for a large number of cameras is time-consuming, these methods are of limited application for our purposes.

(1) webcam-based snow cover monitoring: This is very good concept. It is very good to explain this concept in more detail and how the proposed methodology can be applied and what current status of existing webcam networks is. What should be done apart from improving snow classification methods mentioned in the manuscript?

(2) I am not sure about arbitrary images as one should know the location of camera. May be this is a bit misleading?

(3) It is not clear for me what differences are! In the proposed procedure in the manuscript one has to create "master image" How more easy and accurate is creating master image than procedures in the existing studies?

(4) How about camera locations? How do one get locations of webcams which are need as input in the proposed manuscript? As the objective is "towards webcam-based snow cover monitoring" why not setting GCPs for time-consuming. The creating an accurate master image is an essential part of the proposed work in the manuscript.

How time consuming is creating a good master image? What is applicability of creating master image in various environment as silhouette extraction is based on the assumption that the mountain silhouette in the manuscript. How about open and forested areas isn't it big limitations of the method towards webcam-based snow cover monitoring network? That's why all should be explained!

There is an evaluation on the accuracy of the automatic image-to-DEM registration. There is no an evaluation of the proposed procedure, entitled, "a semi-automatic approach procedure".

As it is mentioned at the end of the discussion in the manuscript "our webcam snow cover maps facilitate the gap filling of partly cloud-obscured satellite-based snow cover maps or improve snow classification in steep terrain 15 or shadow-affected image scenes." It would be good to see some evaluation of the proposed procedure supporting this statement.

Technical Corrections:

In Figure 11: It is good to explain colors like red and blue; which one is Salvatori et.al method and etc.