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Discussions

Interactive comment on "Potential of kite-borne photogrammetry for decimetric and kilometre square 3D mapping: an application for automatic gully detection" *by* Denis Feurer et al.

Anonymous Referee #2

Received and published: 11 May 2017

NHESS D. DOI 10.5194/NHESS-2017-60

Review: Please find herein the review of the paper : "Potential of Kite-borne photogrammetry for decimetric and kilometre square 3D mapping : an application for automatic gully detection" submitted to discussion by Denis Feurer et al.

Generally speaking : This paper deals with the acquisition and application of very high resolution topographic data through a kite using photogrammetric methods on a very local area where it is difficult to get authorizations to fly for UAV. The methodology is well described. An interesting discussion on photogrammetric errors is also given. Finally an application on the mapping of small gullies in the Cap Bon (Northeastern Tunisia) is slightly evocated as an application. This paper is interesting even if the authors

miss some important references both in remote sensing acquired through Kites since 1870 (since the Jean-Felix Tournachon-Nadar - acquisitions through the same kind of settings to survey military puposes in the Paris city during the "Commune") and on the VHR DTM as plenty of works had already been done and published in Geosciences since for instance the last five years. An effort on the bibliography is herein definitely needed in order to be less French IGN/IRD oriented ! The plan of the paper is correctly exposed but several times it is needed to precise and even to rewrite some paragraphs in order to prevent to look for solutions in the following part of the text... Some figures could be easily improved for the topic of the paper. To my point of view this paper should be published in an NHESS issue but with major revision that takes into consideration different points listed above and below.

Into more details : P1: Abstract: Should be locally rewrite in order to expose the reasons why authors used kites and not UAV in that area (facility to fly/low costs/low administrative regulations, etc). p1: No needs to give such details in an abstract (line 7-8), simplify lines 11 to13. P2: 1. Introduction/context : Please cite major authors who used kites in the passed to get informations. Youare not the first ones to do so... p2, l6: "... remains difficult" WHY ? p2, l6: "...Such a race... ? p2, l7: "... coarser data ? p3: l11: "...several others PRECISE p3, l12: the calculation of 3D objects PRECISE p3, l13 and l14: PhotoScan (R) It is needed to be coherent with the same way to write the same softwhere everywhere in the ms. p3, l19: "... and proved equally satisfying PRECISE p3, l26"For instance, Harwin... p3,l31-32 ...in the IGN and IRD field of Geosciences. Precise IGN and IRD. Numerous studies has been done in the world on Geosciences since the last five years using VHRDTM/DEM... p4, l1 : KAP, please cite those who had acquired remote sensing data from that kite-vector through the bibliography. p4, l28 Please give slope angles in degrees not in %. p4, l29: "... several hundred decimetric to pluri-metric size gullies p4, l29: "the outlet...small hill dam... is this dam an outlet or a local base level ? p4, Fig.1. Please optimize the location of the cap bon not in both N and S world hemisphere but located in Tunisia. a quadrangle with the bird's eye view of Cap bon, Tunis and the studied area would

be better. Please add Latitudes/Longitudes + graphical scale, as well as the north and develop a bit the text of the legend of the figure: what is important herein ? p4., l30: What is the time of the dam construction ? p.5, l4: Unclear "global inclination" is it the dip of the strata ? is the topographic slope higher or lower than the dip of the strata ? p6, It is unclear to me if the authors used different 4, 6, 10m2 kites or one which may adapt to the local wind conditions in terms of flying surface. Please precise and probaly re-write that part to make it clearer through the ms. p6, l5: Please precise the wind conditions and line lengths or cite the table 1 here. p6, l7: Precise what you call ...kite remains stable... (no drags for instance) p6, l10: Please precise how you measure the Beaufort wind intensity without anenometer (waves on the lake ?) p6, l11: In field => in the fields... p6, l14 Why is the diameter of the line is that important ? Could you give the weight of both lines (e.g. /m2 or for the used length) ? p7, l7 Precise what is the Yaw angle, show it on Fig.2. p7, l10: Compromise between weight, image quality and cost... could you give indications of the min, average and max of each ? p7,l11: Why is it important to disable the image stabilizer ? P.7: Did you have any accidents/problems with the rig ? could you explain and give more informations on your experiments on flying such a large kite for NHESS readers. p7., l22: Please precise how was acquired the GCP's ? p7, l27: however (and not howver) p7, l32 Data instead "figures" ? p7, l32: precise security reasons ? unclear p8, table 1 precise the difference calibration/acquisition and comment of the table. p8, l7:... is reached. precise how to define the optimal ground resolution of the DTM toward the resolution/precision of the acquired dataset... p8, l8 bundle ? p8, the micmac process... "Two points" please find a text more appropriate. + pbs in the numerotation of the lines of p8. p9, table 2 micmac pipeline command name Tapas is there is a way not to load all the SIFT points calculated in all images ? in order to remove the cited bottle neck in the data processing ? develop a bit the comment of the table. p9, l21 : precise what you call "...a rather poor 3D structure." p10, l3: differnces between original topography and smoothed topography are computed. Plenty of such had already been done since the 19th century in geography see Summit level surfaces processing in order to calculate

erosion balance and son on... please cite a bit former/previous authors. p.11 what is the total load of the rig ? p11.l16: how did you choose the strenght 90kg is it calculated ? p.12, fig. 6: is it 4 or 6m2 delta kite ? what is this surface ? not cited in the texte of the ms... p13: Fig. 7 please increase the contrast by lowering the sun light elevation. it will be clearer. develop the legend of the figure Table 3: please precise error in planimetric and vertical directions p13, l3: Plot limits form humps due to ... please precise not clear enough. p13, l6-7. would allow the production of numerous thematic maps... It is already the case since several years... Page 14, l13: Please develop a bit the application. precise what have a regressive dynamic and spresad into cultivated plots means... p15, l13 Geosciences and not geosciences p15, l22: kites, ? to be modified... p15 these figures are in par with other works (translation pbs ?) p17, 5 Conclusions p17, l16 frugal ? p17, l 25 simulations ?precise p.17, l5: "These results open a new window => these results develops in the fields... p.18, l6: and BETTER understand erosion processes...

Moreover It is needed to precisely check the reference list... Agisoft 2014 missing in the ref list. Verify also that all the listed references are cited in the text... Sincerely.