



Reply to letter to the editor: “*The iPad/iPhone 3D photography app—a promising device, but how about its accuracy?*”

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We are happy to find your readers showed interest in our previous work entitled “Three-dimensional facial scanner in the hands of patients: validation of a novel application on iPad/iPhone for three-dimensional imaging” and left some valuable comments about it in a letter (1,2). By writing this response letter, the authors would like to thank them for their interest and discuss some important points they raised in their letter.

Firstly, in the letter, Fan *et al.* kindly suggested using 3D images as the gold standard. Admittedly, a number of 3D imaging systems have been validated to have good accuracy, and direct measurement using caliper is time-consuming. However, measuring on a virtual model generated by a 3D imaging system is always an indirect method. The authors believe that the gold standard should be the measurement directly taken on subjects in the real world to avoid any possible distortion during imaging, and this is what many investigators did in their studies (3-5). Involuntary movement and soft tissue deformation are two major concerns in direct measurement. To address these problems, we recently consider the possibility of doing direct measurement on mannequin heads.

Secondly, Vectra H2 is now available as the new generation of portable 3D imaging system. Accuracy study using Vectra H2 is necessary to make sure the new device is qualified in different patient populations. It is good

advice to compare our novel imaging system with this new commercial device.

Thirdly, the validation study aimed to test the accuracy of this novel imaging system in the entire face (1). There were two standards in choosing parameters. In the first place, they should be commonly-used parameters that cover the periorbital region, nasal region, and orolabial region; secondly, the parameters should include horizontal distances, vertical distances, and sagittal distances. Fan *et al.* put a good point that the novel system should undergo a more detailed validation study in the periorbital region (2). Further study using more specific periorbital landmarks will be conducted in the future.

3D imaging and stereophotography-based anthropometric measurements are important for the clinical practice of many departments. Improving the accuracy and portability of 3D scanners should always be a goal for researchers in this field. Hopefully, 3D imaging technology will continue to advance in the future.

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References

1. Chong Y, Liu X, Shi M, et al. Three-dimensional facial scanner in the hands of patients: validation of a novel application on iPad/iPhone for three-dimensional imaging. *Ann Transl Med* 2021;9:1115.
2. Fan W, Rokohl AC, Guo Y, et al. The iPad/iPhone 3D photography app—a promising device, but how about its accuracy? *Ann Transl Med* 2022;10:649.
3. Weinberg SM, Naidoo S, Govier DP, et al. Anthropometric precision and accuracy of digital three-dimensional photogrammetry: comparing the Genex and 3dMD imaging systems with one another and with direct anthropometry. *J Craniofac Surg* 2006;17:477-83.
4. Dindaroğlu F, Kutlu P, Duran GS, et al. Accuracy and reliability of 3D stereophotogrammetry: A comparison to direct anthropometry and 2D photogrammetry. *Angle Orthod* 2016;86:487-94.
5. Othman SA, Saffai L, Wan Hassan WN. Validity and reproducibility of the 3D VECTRA photogrammetric surface imaging system for the maxillofacial anthropometric measurement on cleft patients. *Clin Oral Investig* 2020;24:2853-66.