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Conference Abstract

Possibility of 3D Model Collections with LiDAR: Simply, Easily, and Inexpensively in Paleontology

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Abstract

Until several years ago, it was difficult for the general public to acquire 3D data. Recently, portable devices have been equipped with LiDAR (Light Detection And Ranging). LiDAR is a method for determining ranges by targeting an object or a surface with a laser and measuring the time for the reflected light to return to the receiver. It is easy to acquire 3D data by LiDAR at low cost, so making 3D digital specimens and using 3D databases have become more popular. This study aims to to investigate the possibility of creating 3D digital model collections in paleontology using a simple, easy and inexpensive approach that applies portable devices equipped with LiDAR. Two Apple iPad Pro® (3rd and 4th generation) and an iPhone® 15 Pro equipped with LiDAR are used with the Scaniverse application. The scanning distance of Scaniverse is from 0.3 m to 5.0 m for 3D modelling. Targets of paleontological 3D models in our study, range from hand-sized specimens to exhibits several meters in size, exhibition rooms and outcrops, including a 5 cm ammonite and an ~3 m full-body replica of Naumann's elephant, *Palaeoloxodon naumanni*. In this case study, it was difficult to make 3D models of specimens under 10 cm diameter. On the other hand, 3D modelling of specimens greater than 10 cm, and up to 5 m long produced reasonable results. These 3D model collections can be used as exhibits and for education by making 3D printings and virtual reality (VR) models. Because the LiDAR technology is now built into common devices, problems may arise

because anyone could make and share 3D models simply, easily, and inexpensively. Several issues of ownership, such as copyright, could arise from creating these models because digital data policies are not uniform or codified between museums and institutions. In the future, rules to govern these collections internationally need to be developed.

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Conflicts of interest

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