

Development of Image Processing Application for archiving inscription.

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There are many stone monuments in the areas affected by the Tokai and Nankai earthquakes in the past. However, most stone monuments have deteriorated because of weathering. Furthermore, accurate information is no longer available if the stone monuments themselves were lost. Therefore, it is urgently necessary to archive as many stone monuments as possible.

It is difficult to decipher weathered inscription from ordinary photographs. Due to the ambiguity of the photo images of inscription, digitizing and archiving the text on the surface of stone monuments is always problematic. The quality of the images taken under different conditions changes largely, making it also decrease the quality of the archive.

Recently, methods for restoring the shape of stone monuments based on the images taken from different direction have dramatically advanced, and it became possible to automatically restore the three-dimensional shape from a large number of digital photographs [1-2]. However, it was difficult to apply those methods to the fieldwork of the huge number of stone monuments because of complex and time-consuming procedure of the methods.

We are developing a new method of digital archiving of inscriptions [3-4]. Our method emphasizes three features, “Speedy”, “Simple”, and “Lightweight” for the fieldwork, because of the variable condition of stone monuments. Photographic instruments should be made lightweight to make it possible to visit several places with variable conditions. For this reason, we constructed the new photography scheme as simple as possible in the beginning of the series of our studies [reference].

We also developed image processing software for digital archiving of inscription on stone monuments. There are two features in the software. First, shadow of the engraved characters on the stone monument was enhanced for easy recognition of text by removing background noises. Second, the area only illuminated by oblique hand-light was extracted by masking with the illumination image.

The software succeeded in speeding up for the procedures of image processing step, and also improved the readability of the inscription text. Our new scheme and software can applicable not only inscriptions, but also divers samples of the historical and Archaeological materials, to digitize their surface shape in speedy.

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