3D documenatation of the petalaindera: digital heritage preservation methods using 3D laser scanner and photogrammetry

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Abstract

3D imaging technologies have undergone massive revolution in recent years. Despite this rapid development, documentation of 3D cultural assets in Malaysia is still very much reliant upon conventional techniques such as measured drawings and manual photogrammetry. There is very little progress towards exploring new methods or advanced technologies to convert 3D cultural assets into 3D visual representation and visualization models that are easily accessible for information sharing. In recent years, however, the advent of computer vision (CV) algorithms make it possible to reconstruct 3D geometry of objects by using image sequences from digital cameras, which are then processed by web services and freeware applications. This paper presents a completed stage of an exploratory study that investigates the potentials of using CV automated image-based open-source software and web services to reconstruct and replicate cultural assets. By selecting an intricate wooden boat, Petalaindera, this study attempts to evaluate the efficiency of CV systems and compare it with the application of 3D laser scanning, which is known for its accuracy, efficiency and high cost. The final aim of this study is to compare the visual accuracy of 3D models generated by CV system, and 3D models produced by 3D scanning and manual photogrammetry for an intricate subject such as the Petalaindera. The final objective is to explore cost-effective methods that could provide fundamental guidelines on the best practice approach for digital heritage in Malaysia.

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1. Title: [not available] **Times Cited: 1**
   By: [Anonymous].
   Autodesk Maya features and tutorials Published: 2017
   Retrieved from
   URL: http://www.autodesk.com/products/maya/overview

2. Title: [not available] **Times Cited: 1**
   By: [Anonymous].
   FARO products and features Published: 2017
   Retrieved from
   URL: http://www.faro.com/en-sg/home

3. Title: [not available] **Times Cited: 1**
   By: [Anonymous].
   Meshlab features and tutorials Published: 2017
   Retrieved from
   URL: http://www.meshlab.net/#references

4. Title: [not available] **Times Cited: 1**
   By: Crawford, Abby.
   How to set up a successful photogrammetry project Published: July 18 2015
   Retrieved from
   URL: https://blog.sketchfab.com/how-to-set-up-a-successful-photogrammetry-project/

5. **The International Archives of the Photogrammetry** **Times Cited: 1**
   By: Linguaa, A; Piumatti, P; Rinaudo, F.
   Remote Sensing and Spatial Information Sciences Volume: XXXIV
   Part 5/ W12.

6. **Multi-image photogrammetry as a practical tool for cultural heritage survey and community engagement** **Times Cited: 60**
   By: McCarthy, John
   JOURNAL OF ARCHAEOLOGICAL SCIENCE Volume: 43 Pages: 175-185 Published: MAR 2014

7. **Heritage Recording and 3D Modeling with Photogrammetry and 3D Scanning** **Times Cited: 204**
   By: Remondino, Fabio
   REMOTE SENSING Volume: 3 Issue: 6 Pages: 1104-1138 Published: JUN 2011

8. **'Structure-from-Motion' photogrammetry: A low-cost, effective tool for geoscience applications** **Times Cited: 920**
   By: Westoby, M. J.; Brasington, J.; Glasser, N. F.; et al.
   GEOMORPHOLOGY Volume: 179 Pages: 300-314 Published: DEC 15 2012

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