

TouchMoon: A 3D Multi-touch Virtual Moon Application. X. Y. GAO^{1,2}, W. ZUO^{1,2}, J. J. LIU^{1,2}, X. REN^{1,2}, Z. B. Zhang^{1,2}, and X. G. ZENG^{1,2}, ¹Key Laboratory of Lunar and Deep Space Exploration, National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China. ²National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China. (gaoxy@nao.cas.cn, zuowei@nao.cas.cn, liujj@nao.cas.cn, renx@nao.cas.cn, zhangzb@nao.cas.cn, and zengxg@nao.cas.cn)

Introduction: With lunar exploration activities carried by Chang'E-1, Chang'E-2, Chang'E-3 and Chang'E-4 lunar probe, a large amount of lunar data has been obtained, including topographical and image data covering the whole moon, as well as the panoramic image data of the landing point of Chang'E-3 and Chang'E-4. It is necessitated to build virtual moon based on those lunar exploration data which will help scholars to carry out research on lunar topography, assist the further exploration of lunar science, and the most important implement is for the facilitation of lunar science outreach to the public. So the 3D Multi-touch Virtual Moon Application TouchMoon is presented here. The software is able to display simultaneously massive raster data and terrain data obtained by Chang'E-2 satellite, panoramic image data obtained by Chang'E-3 and Chang'E-4, 3D models such like rover and lander model, as well as lunar names. The software embedded tens of animations which introduce moon typical topography with voice to increase user's interest. The application runs on touch screen devices such as tablets, so it is easy to use for everyone. 3D engine of TouchMoon is based on open source libraries, such as OpenSceneGraph, osgEarth., while the HMI based on QT. Now TouchMoon as an exhibit in China's science Museum plays an important role in moon science outreach to the general public.

Software Architecture: The software is principally developed in C++. The OpenSceneGraph SDK is the core of TouchMoon. The main GIS features are handled with the osgEarth library while the HMI widgets are managed with Qt.

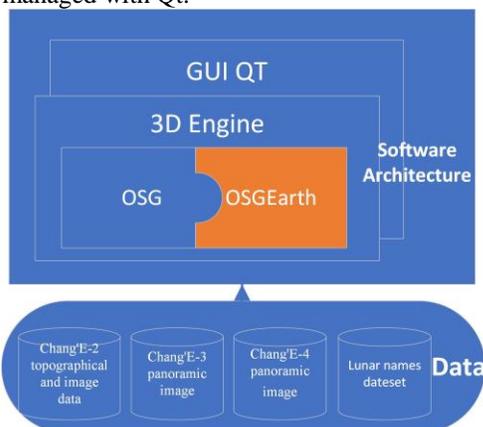


Fig. 1 TouchMoon software Architecture

Summary: Now TouchMoon constructed in this paper has been an exhibit in China's science Museum and plays an important role in moon science outreach to the Chinese general public.



Fig. 2 TouchMoon as an exhibit in science Museum

References:

- [1] A. Sarthou, S. Mas et al. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-3/W3, 2015