Multi-mission capability of HARMONICS

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This research has updated HARMONICS from a viewpoint of multi-mission capability, such as the Martian satellite exploration mission MMX in 2020s. Newly additional function is Switching on the shape model interface.

Bird view and visualization of FOV is important in robotics control. This technology is also used for deep space explorer missions.

HARMONICS is visualization tool of FOV(Field Of View) of scientific instruments and spacecraft's position for HAYABUSA mission. The software has been updated by University of Aizu students of the past. The original HARMONICS had been developed by Nemoto(2006). GUI of HARMONICS had been replaced GUI library from GKT to Qt and added new functions, such as interactive modification of input mission plan by Ueno+(2017). The software had been add FOV frustum function by Aoki(2017). HARMONICS has tried to manage data for each project based on preference file in 2018.

HARMONICS should improved scalability to be compatible for ongoing mission. HARMONICS had been used to decide shutter chance by Camera Science Team in the asteroid Itokawa rendezvous of HAYABUSA. This software has not used in the asteroid Ryugu rendezvous of HAYABUSA2. The proven software should be use for future ongoing missions other than HAYABUSA. This research is development to HARMONICS adapt to ongoing missions.

I separated the designation of the data set from the source code and clarified the part edited by the user and the part edited by the developer.

HARMONICS has the function to switch and display data of different missions by this research. When users extend HARMONICS for multiple missions, users don't need edit source code. User needs only kernel and the shape model of spacecraft and target asteroid. User do not need tough coding. User can use easily HARMONICS by editing preference file and kernel.

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