

Wasawatt Thothong, Flight Lieutenant 2010: Vibration Analysis of a Helicopter Using Image Processing. Master of Engineering (Aerospace Engineering), Major Field: Aerospace Engineering, Department of Aerospace Engineering. Thesis Advisor: Squadron Leader Prasatporn Wongcamchang , Ph.D. 140 pages.

The purpose of this thesis is to study theory of image processing in order to perform vibration analysis of structure which focuses aircraft structure. The analysis will perform by analyze the video image which take from high frame rate video camera attached on the vibration simulation machine. After the implemented algorithm is satisfy with the result from vibration simulation machine, apply the implemented algorithm with the video image which take from airborne test on Royal Thai Air Force helicopter model UH-1H

The image processing method used in this thesis is Block Matching and various type of Search Method and also modified Block Matching algorithm Algorithm in order to perform the vibration resulted from the vibration simulation machine and the helicopter The motion estimation of analyzed video image using implemented algorithm will give result in format of Motion Vector of Macro Block center of each video image frame. The motion vector will indicate that how far of movement between each video image frame. Those process could analyze vibration of vibration simulation machine and helicopter

Experimental result shown that the proposed algorithm could analyze the vibration of Vibration simulation machine precisely but there is some error when analyze the vibration of real helicopter. The propose algorithm has some usage limitation such as sharpness of video image and size of image to use in analysis

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Student's signature

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Thesis Advisor's signature