

## **ABSTRACT**

*Centrifugal pump is one of the energy conversion machines that have been widely used in industries such as power plant, petroleum, water treatment, and waste treatment. The use of pumps in the industrial world is crucial in the series of work system of the production process. Seeing the importance of its role, it is very important to maintain its optimal performance and the decrease of its performance will not occur. One of the causes of pump fault is cavitation. The cavitation phenomenon is usually characterized by the appearance of the bubbles in the suction pipe which can affect the components in pump such as impeller and bearing. Therefore, research is needed which aims to detect and develop method to centrifugal pump due to cavitation phenomena.*

*This research was carried out by detecting the initial cavitation in a centrifugal pump. Data processing through extraction of statistical features, statistical data selection using PCA, and classification of PCA data selection results using SVM. Variations in pump operating conditions in this study were variations of valve blockage which aimed to create cavitation in the test rig design. Variations consist of 25% (720°), 50% (1440°), and 75% (2160°) blockage.*

*The PCA process produces the first 3PC which is 90% of the variance used as input in the classification process using SVM. The results of multi class and binary SVM classification were successfully carried out with 100% accuracy. This already showed that the classification model built in the training process and the mapping process is optimal.*

**Keywords:** *Centrifugal Pump, Cavitation, Vibration, Rig Test, Statistical Parameters, PCA, SVM.*