

## **ABSTRACT**

*Milk is one of the foodstuffs containing high nutrition as a component of animal protein. Milk contains 88% water with 12% dry ingredients including fat, protein, minerals, and carbohydrates. Cow's milk is good to be consumed by all people from toddlers, teenagers, adults, to the elderly because of its nutritional content, texture, taste and benefits.*

*It is not uncommon for milk sellers to take advantage of these conditions to reap high profits by mixing water or other ingredients. Until now consumers were not aware of any mixture in milk consumed.*

*From these problems, this Final Project designs a system to detect the presence of mixtures in milk through digital image processing using the Active Contour method with the classification of K-Nearest Neighbor (KNN). The system design uses software, and aims to facilitate the detection of the level of purity of milk to be consumed. The data used were 500 images with 300 images as training data and 200 images as test data. The level of purity of milk is divided into 5 classes namely 20%, 40%, 60%, 80%, and 100% with a mixture of water.*

*This research produces the best system accuracy using the City block classification type by 100% with a computational time 322.25 seconds. These results are obtained from parameters  $K = 5$ , image size  $512 \times 512$  pixels, and iteration 500.*

***Keywords: Image processing, Active Contour, K-Nearest Neighbor***