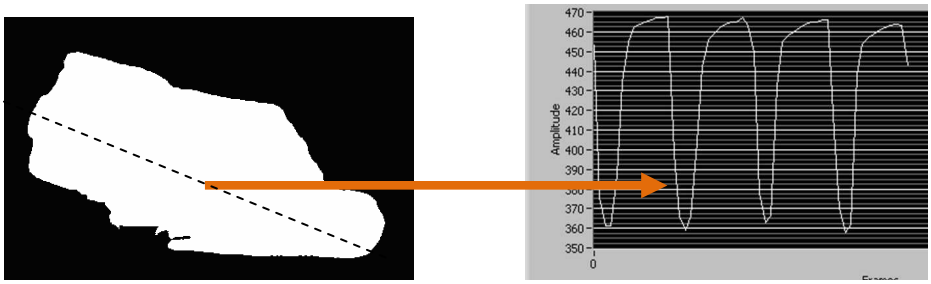

Fig. 10. Processed image of isolated cardiomyocyte with filled holes and a marked line where contraction is measured (left), example of measurement of cardiomyocyte contraction with method of counting cell pixels (right).

Some basic parameters such as peak shortening, time to peak shortening, relaxation time can be calculated too.

4 Discussion

An usual measurement set consists of digital camera connected to video processing and contraction measurement system. The cardiac cells are stimulated with external hardware electric field generator. The developed system is all-in-one and includes both parts for cardiomyocyte stimulation and for image processing and contraction analysis controlled by PC. No external stimulator or other devices are needed. Video processing LabVIEW Vision system processes raw video signal to black and white cardiac cell image with no redundant objects. The contraction signal and basic parameters can be calculated then.

The image processing system was tested in several different experiments with a number of isolated cells. The software part of the system allows adjustment to available processing images with lower brightness and/or contrast. It is required in fluorescence experiments with poor light conditions.

5 Conclusions

The paper presents effective solution for cardiomyocyte stimulation and contraction measurement. It shows its properties and suggests types of possible experiments.

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