

# AI-based Automated Free Flap Monitoring System

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After free flap surgery, flap monitoring is highly correlated with the patient's prognosis. However, traditional method requires medical staff to monitor at regular intervals, which incurs a lot of time investment and increased workload. Through an AI model-based automatic free flap monitoring system, this study is expected to improve work efficiency in the medical field.

This study was divided into two model: the surgical site recognition model and the flap state analysis model. Model 1(Flap segmentation) recognizes the surgical site. The dataset was labeled with flap and others according to the boundary of free flap. The flap segmentation model used UNet, which is often used in the medical AI, and additional training of pre-trained VGG16. This model for detecting the surgical site resulted in an IOU of 0.931. Model 2 (Flap grade classification) analyzes the state of the flap surgery site. Using the flap dataset recognized in Model 1, model 2 used CNN model by dividing datasets into normal-state Grade 1 and 2 and abnormal-state Grade 3. The risk score is used to determine flap abnormalities according to the area of the red area and call the medical staff. Through flap segmentation and flap grade analysis stages, free flap monitoring system based artificial intelligence utilized well.

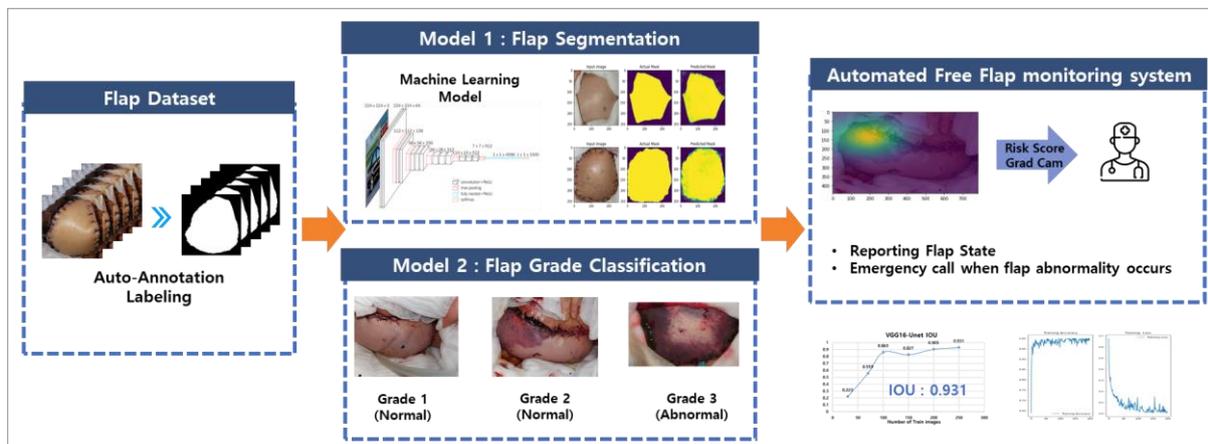


Figure 1 Overview of Automated Free Flap Monitoring System

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## References

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