# Generating Quadrat Images for Identifying Sea Bottom Matrices using GAN

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Sea bottom images is a valuable resource for environmental conservation studies or conservation studies. Among the different approaches utilizing images, the quadrat image method is a useful approach in the field of environmental conservation studies. When capturing images of the sea bottom using a camera, a reference measure is placed on the seabed to obtain the spatial resolution from the captured image. By using these images, humans can obtain the information about the different matrices in the images, which is then statistically analyzed for environmental conservation studies. But it takes huge human cost since the number of images is extremely large like 20,000 images and the task is manually done by human operators.

Therefore, we are currently developing CNN-based methods by CNN for the identification of matrices in the sea bottom images. The structures of sea bottom matrices are complicated making their recognition challenging.  To apply the CNN for the recognition more efficiently, we must get information around the pixels as recognition point and craped images. In our cases, we extract image as approximately 8cm x 8cm size. These extracted images use for the recognition and train for the CNN. Generally, sea bottom images are degraded due to weather, dirty of the sea, blur, and so on. These images degraded by these factors cannot use as "training images". Some implementations have been already proposed to improve the problem by image enhancements or image corrections. But these implementations are not enough to improve the problem because these images by the enhancements are not enough to variation of data. Therefore, we apply GAN's method to generate sample sea bottom images to increase the training images. At first, we generate some coral images by the GAN and evaluated whether the data in suitable for the training data by researchers of environmental conservation studies or conservation studies. From their comments, we also generated improved training images and evaluated them again.