✖✖ Cybercore®

December 6, 2021
Cybercore Co., Ltd.

Cybercore, the world's award winning, Image Recognition AI Developer has released "DetectEye™", a Zero-false-learning-required, Anomaly Detection AI. The edge version will be available soon.

Cybercore Co., Ltd., an image recognition AI algorithm developer (hereafter, described as "Cybercore", CEO; Hideshi Abe, headquartered in Morioka, Iwate, Japan) had released AI product, **DetectEye™**, which detects abnormal/false images by learning a few hundred "correct/true images" only. Anomaly detection AI released from Cybercore enables to cut down the learning cost and the time completely due to simplified learning process by feeding "correct/true" images only, which conventionally both correct/true and incorrect/false images were required.

Cybercore's original **DetectEye™** consists of two AI components; "Feature Extracting AI" and "Feature Organizing AI". (*Diagram 1)
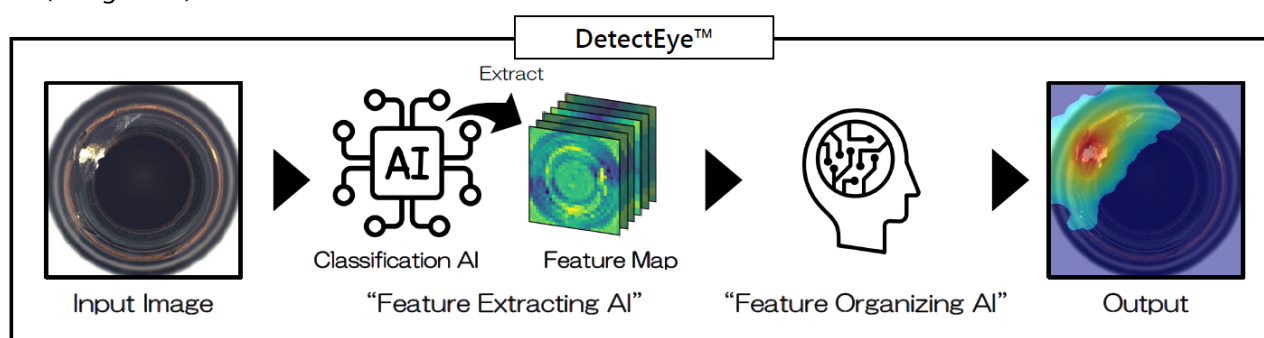

Diagram1

These two AIs are both linked while processing. Firstly, feature maps are extracted from input images by the "Feature extraction AI" which uses the input-learned highly accurate image classification AI. Then, the "Feature Organizing AI" analyzes obtained feature map similarities comparing with the "correct/true" image feature maps. It, then, detects low similarity areas as abnormal (0~100%) in pixels. Lastly, it colors the detected areas based on obtained abnormal values (both the area and the level) to enable visualization of the area with the gradation. (*Diagram 2).
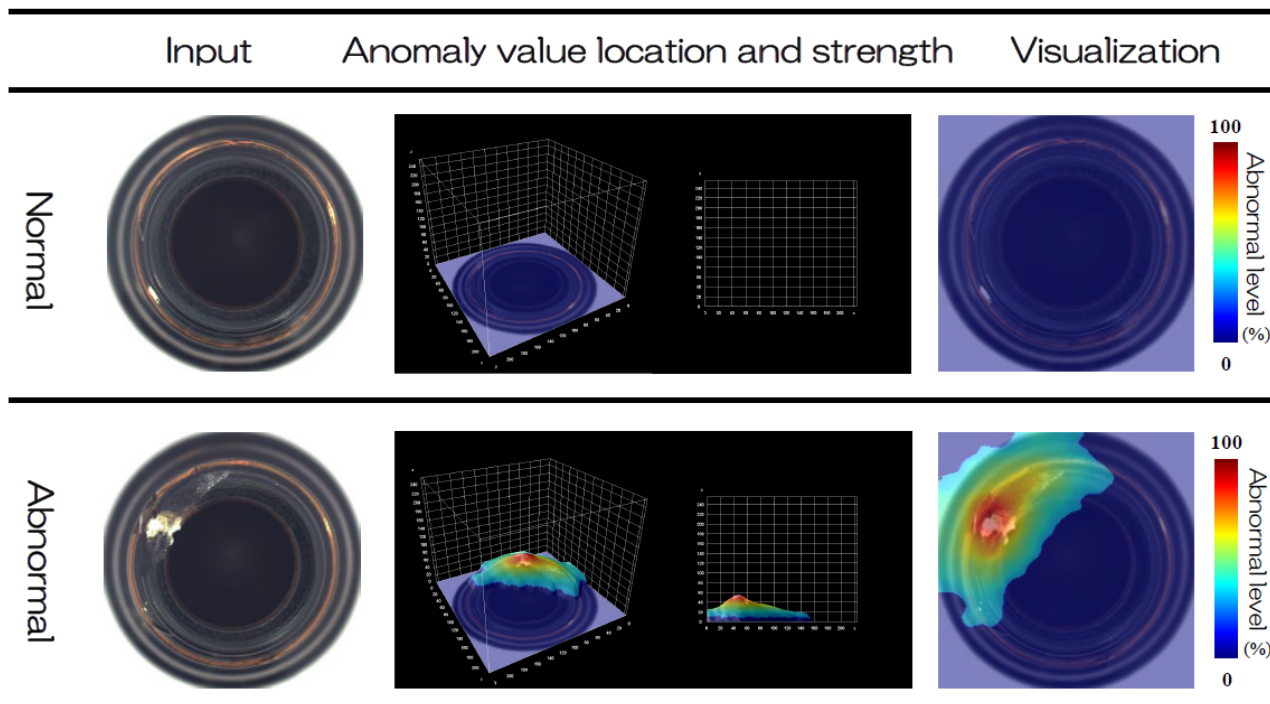
Diagram 2

In addition, the "Feature Organizing AI" made to re-calculate appropriate abnormal threshold values by inputting "correct/true" images after learning. Therefore, it is made to strive stabilizing anomaly detection accuracy level high to avoid false detections. This process is done only once at the time of learning.

DetectEye™ main features are as follows.

1. High speed learning & inference
   - In DetectEye™, only the "Feature Organizing AI" needs to be trained, as the "Feature Extracting AI" is already trained. Since the computational cost of the "Feature Organizing AI" is small, it takes less than a minute (<0.01 sec.) to train hundreds of colored images with a resolution of 200x200px. The image size can be freely configured.

2. Scalability
   - By simply replacing the image classification AI used in the "Feature Extraction AI", we can improve the accuracy and speed up the process. It is easy to improve the performance of DetectEye™ by replacing the image classification AI used for "Feature Extraction AI" with our state-of-the-art image classification AI.
   - By optimizing the image classification AI used in the "Image Feature Extraction AI" for edge devices, it is possible to miniaturize the anomaly detection system without having a dedicated training PC. (coming soon)

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DetectEye™ is a new addition to Cybercore's lineup of core technologies, including the **LuxEye®** image sharpening library, **the NeuroEye®** lightweight AI algorithm, and the **WipeEye®** missing image restoration algorithm. **DetectEye™** eliminates the cost of collecting defective images, making it possible to develop anomaly detection solutions faster and at a lower cost.

Cybercore has been active in international AI competitions, where Japanese companies have had little success. In 2018, we were the runner-up out of 2,261 entries in the iMaterialist category at the prestigious international AI competition and conference CVPR 2018. Moreover, in April this year (2021), the vehicle re-identification (ReID) algorithm was ranked number one in the world by Papers with Code, an international algorithm evaluation site. Then, in June of this year, the company won the 1st prize at the YouTube-VOS 2021 Challenge, an international competition for image AI, out of 331 entries, and gave two presentations at the aforementioned conference, CVPR 2021.

We have a track record of developing solutions in a wide range of fields, including automated driving, infrastructure, such as the **RushEye®** AI system for measuring congestion rates using depth cameras, which has already been introduced in the Tokyo Metro, factory automation (FA), medical and welfare, and retail sectors such as convenience stores.

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