

Office of Technology Commercialization

# CT-Bound: A Fast Boundary Estimation Method for Noisy Images



**Technology ID** 2024-GUO-70592

#### Category

All products Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition

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Researchers from Purdue University developed CT-Bound, a method for fast boundary estimation from noisy images using a hybrid convolution and transformer neural network. This architecture greatly improves image boundary detection by decomposing boundary detection into detecting local boundary structure and global regularization. CT-Bound is computationally efficient and generalizes seamlessly from synthetic training data to real images, reaching performances 100 times faster than current approaches with comparable accuracy. Applications for the system vary among medical imaging, manufacturing, and autonomous navigation.

## **Technology Validation**

CT-Bound was validated using real-world photographs taken by a camera at various levels of noise. Results demonstrated quality boundary and color maps without fine-tuning on real images. Compared to the other state-ofthe-art algorithms, CT-Bound was 100 times faster and more accurate.

### Advantages

-Versatile Applications

-High Accuracy

-Time-efficient

-Produces high-quality boundary and color maps

Applications

-Medical Imaging

-Manufacturing

-Autonomous navigation

Publication Link: https://ieeexplore.ieee.org/abstract/document/10743517

<u>Keywords:</u> Electrical Engineering, Computer Technology, noisy images, Image Processing, Computer Vision, boundary estimation, image denoising, convolutional neural network, transformer