**2017-** **Perceptual generative adversarial networks for small object detection**

Now, detecting small objects is challenging due to their low resolution and noisy representation in images.

There are existing object detection pipelines that detect through learning representations of all the objects at multiple scales but the performance gain is limited due to ad hoc architecture.

In this paper, they address the small object detection problem by developing a single architecture that internally lifts representations of small objects to “super-resolved” ones, achieving similar characteristics as large objects and thus more discriminative for detection.

They propose a new Perceptual GAN model that improves small object detection.

Specifically, its generator learns to transfer perceived poor representations of the small objects to super-resolved ones that are similar enough to real large objects to fool a competing discriminator.

Meanwhile its discriminator competes with the generator to identify the generated representation and imposes an additional perceptual requirement (– generated representations of small objects must be beneficial for detection purpose) on the generator.

Small object detection includes Traffic Sign detection, Pedestrian detection.

**Conclusion**: - Perceptual GAN generates super-resolved representations for small objects to boost detection performance by leveraging the repeatedly updated generator network and the discriminator network. Competition in the alternative optimization of both networks encourages the Perceptual GAN to generate super-resolved large-object like representations for small objects, thus improving detection performance.