

## NVIDIA Talks

### Applications of Deep Learning to Computer Vision and Computer Graphics

The presenter was describing how deep learning neural networks' algorithms can have an extensive application in computer vision and computer graphics. The algorithm is heavily used in image processing and computer vision especially in images that contain fog or haze, it is implemented in a way where pixels are structured in a tree then the neural network runs every frame to analyze the data contained in the tree this way a robust object detection is guaranteed even with the existence of noise.

Surprisingly when deep learning algorithms were used in face recognition they were more accurate than humans.

Other application includes action recognition, game training, semantic segmentation (determine object types in the scene usually used in self driving cars), super resolution which is using depth information to improve the quality of the image, also a recent paper used deep learning in ray tracing using monte Carlo denoising.

Another application that people probably have seen on the news and was quite bizarre is lucid dreaming paintings of deep learning networks which of course was a little different from what was reported on the news. These painting are usually a result of querying the system for weird things like what would a dog fish look like? or what would a human horse or a three-toed sloth would look like?

Other applications include: 3D point clouds and LIDAR through fusion

The main expectation of the algorithm lies in the applications of predictions, predictions systems are behind and they don't usually work the way people think it usually predicts over a trajectory pattern, which might not be very helpful in many cases.

One downside is trying to improve deep learning neural networks is a brute force experimental task.

Challenged in managing a deep learning neural network is overfitting, over training, augmentation, normalization.

A final comment from the presenter is that deep learning neural networks are fascinating because it violates all math predictions but it still works.