

Potential Applications of Deep Learning across Domains

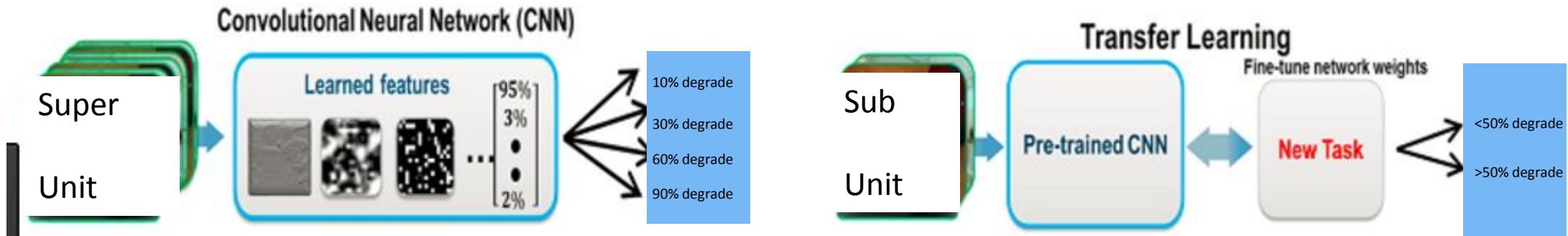


Devesh Raj

Potential Usages of DNN at Various domains

Computer Vision

Creating a massive pre-trained model for domain specific vision problems



Training data	1000s to millions of labeled images
Computation	Compute intensive
Training Time	Days to Weeks for real problems
Model accuracy	High (can over fit to small datasets)

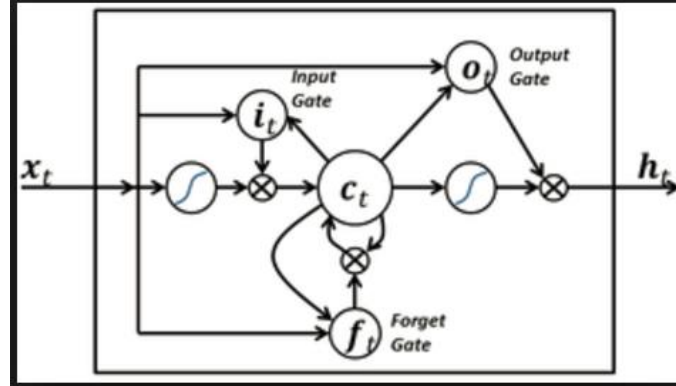
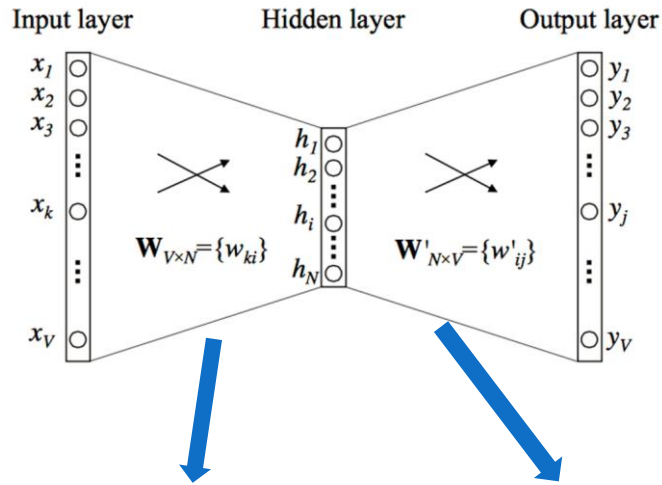
Training data	100s to 1000s of labeled images (small)
Computation	Moderate computation
Training Time	Seconds to minutes
Model accuracy	Good, depends on the pre-trained CNN model

- Training a CNN network on vast repository of domain specific engineering components' images
- The learned features are then utilised via transfer learning on other usecases which uses similar components but have less labelled data

Potential Usages of DNN at various domains

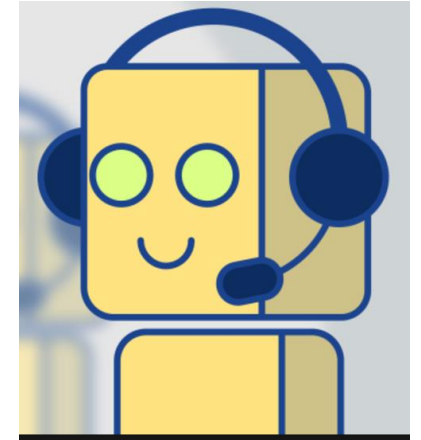
Natural Language Processing

Creating a massive word embedding for domain specific terms specific to company

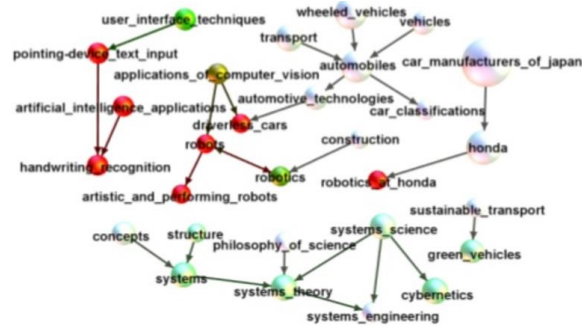
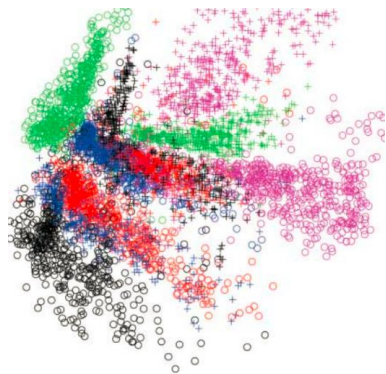


LSTM-Long Short Term memory RNN

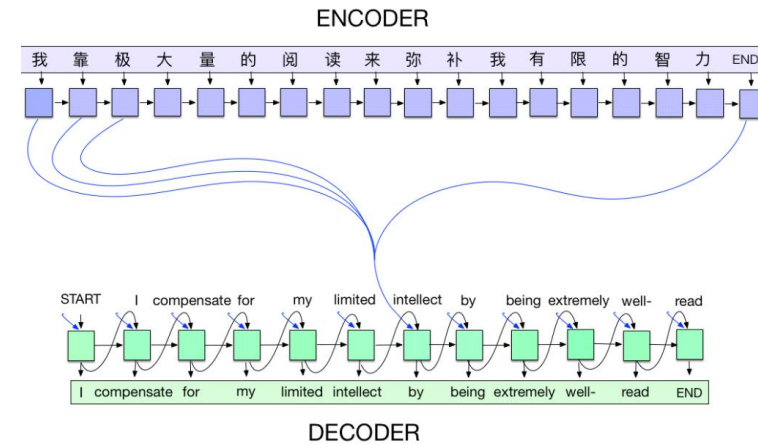
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Chatbots for engineering/
/HR/Finance applications



Lexical semantic relationship

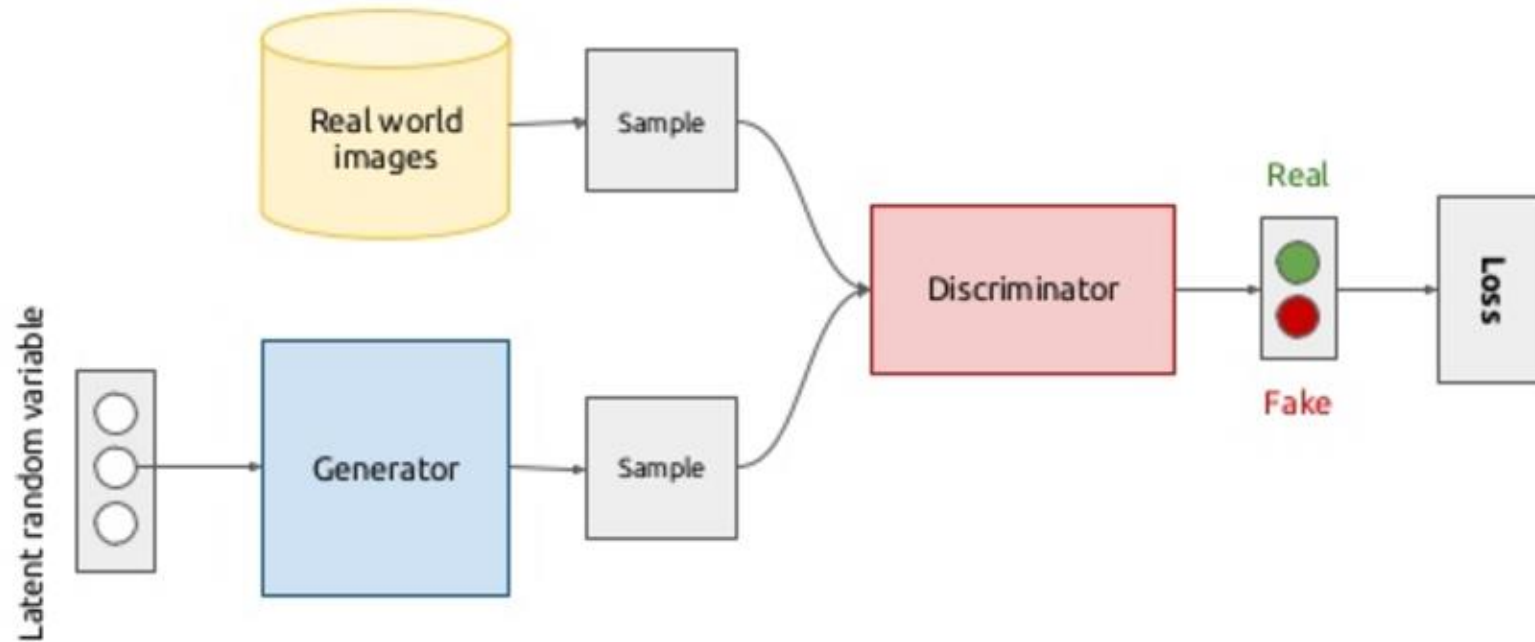


Machine translation of languages
across company's locations

Vector representation of terms

Generative Adversarial Networks (GAN)

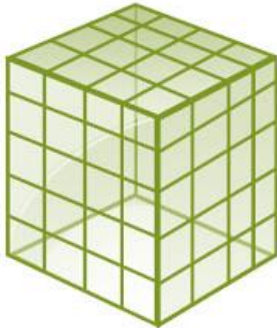
Creating artificial data to trick-train the model



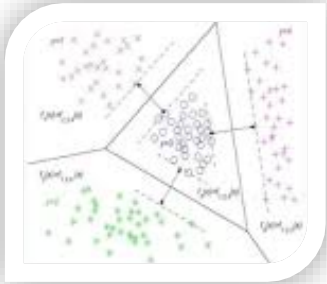
- Over a period of training, Generator starts generating real-like images which is passed by the discriminator
- These real-like images can be used to trick-train our models where there is scarcity of good quality labelled data to artificially train the deep networks to solve specific use cases in the domain.

Predictive Maintenance using exhaustive Features

Input features from machines



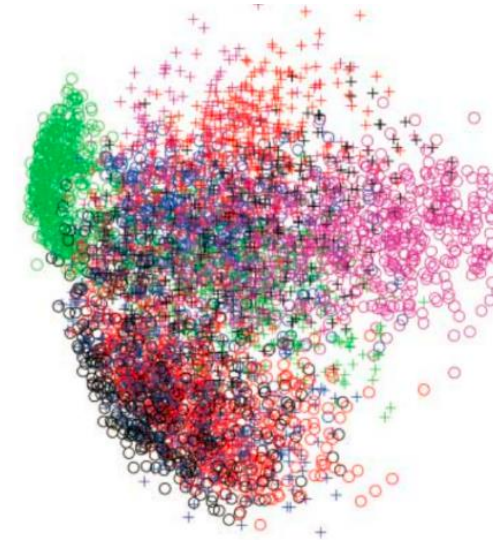
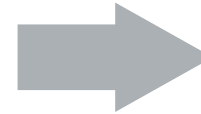
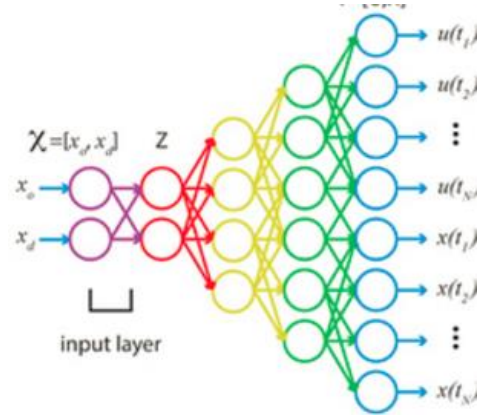
Exhaustive Feature list



Multi-Class Classifier

Churn Prediction across domains

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \dots \\ x_n \end{bmatrix}$$



Exhaustive Feature Space covering the Latent features also

Deep Learning Denoising Autoencoder creating an exhaustive feature space

Thank You