

# Generative Adversarial Networks

## Overview

### **Prelude (from lecture 6b):**

- **Introduction** (Slide 1-6)
- **Denoising Autoencoder** (Slide 7-18)
- **Context Encoder** (Slide 19-24)
- **Predicting one view from another** (Slide 25-39)

### **Content - Image Processing (lecture 7):**

- **Relative Position of Image Patches** (Slide 34-39)
- **Rotation Net** (Slide 40-45)
- **Tracking Emerges by Colorizing Videos** (Slide 46-53)

### **Content - Language Processing (lecture 7):**

- **Word2Vec** (Slide 54-68)
- **CPC** (Slide 69-90)
- **BERT** (Slide 91-109)

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## Content

### **Relative Position of Image Patches**

- Main Reading: <https://arxiv.org/pdf/1505.05192.pdf>

### **Rotation Net**

- Main Reading: <https://arxiv.org/abs/1603.06208>

### **Tracking Emerges by Colorizing Videos**

- Main Reading: <https://arxiv.org/abs/1806.09594>

### **Word2Vec**

- Main Reading: <https://www.aclweb.org/anthology/N13-1090/>

### **Contrastive Predictive Coding**

- Main Reading: <https://arxiv.org/pdf/1807.03748.pdf>

### **BERT**

- Main Reading: <https://www.aclweb.org/anthology/N19-1423/>

### **Context Encoders: Feature Learning by Inpainting**

<https://arxiv.org/pdf/1604.07379.pdf>

Loss function = Reconstruction Loss + Adversarial Loss

Explanation on Loss from the paper:

When training context encoders, we have experimented with both a standard pixel-wise reconstruction loss, as well as a reconstruction plus an adversarial loss. The latter produces much sharper results because it can better handle multiple modes in the output.

Presenter two was talking about Deep Learning:

Here are the papers for my presentation (slide 34-53)

1. Unsupervised Visual Representation Learning by Context Prediction  
<http://arxiv.org/abs/1505.05192>
2. Unsupervised Learning of Visual Representations by Solving Jigsaw Puzzles  
<http://arxiv.org/abs/1603.09246>
3. Unsupervised Representation Learning by Predicting Image Rotations  
<http://arxiv.org/abs/1803.07728>
4. Tracking Emerges by Colorizing Videos <http://arxiv.org/abs/1806.09594>

### **Split-Brain Encoder**

<https://arxiv.org/pdf/1611.09842.pdf> (Summary on <https://richzhang.github.io/splitbrainauto/>)

<https://www.aclweb.org/anthology/D18-2029/>

### **Bert**

[https://drive.google.com/open?id=1jmbYalyE88wYHz9U3mqd4GIO\\_gHyC0-W](https://drive.google.com/open?id=1jmbYalyE88wYHz9U3mqd4GIO_gHyC0-W)

PLMpapers released by THU NLP Group:

<https://github.com/thunlp/PLMpapers>