**作业:** 每个小组10位成员合作完成对应序号领域（小组序号为2的对应下面的Text-To-Image Synthesis）的一篇大报告和2份代码调试。每个领域下面都有相应的代表论文，同学们可以根据这些论文对相应的领域有所了解。

**注意：** 大报告需要包含至少5篇来自最近两年的顶会论文（CVPR，ICCV，ECCV，ICML，ICLR，KDD，ACL，NIPS，NAACL，AAAI，IJCAI，EMNLP，SIGIR），总结论文的动机，方法，实验细节和结果。代码尽可能的去找github高星的项目进行调试。

1. **Image-To-Image Translation**

# 代表论文：《Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks》《Image-to-Image Translation with Conditional Adversarial Networks》《Toward Multimodal Image-to-Image Translation》《DualGAN: Unsupervised Dual Learning for Image-to-Image Translation》《StarGAN: Unified Generative Adversarial Networks for Multi-Domain Image-to-Image Translation》

1. **Text-To-Image Synthesis**

# 代表论文：《StackGAN++: Realistic Image Synthesis with Stacked Generative Adversarial Networks》《StackGAN: Text to Photo-realistic Image Synthesis with Stacked Generative Adversarial Networks》《Generative Adversarial Text to Image Synthesis》《AttnGAN: Fine-Grained Text to Image Generation with Attentional Generative Adversarial Networks》《Controllable Text-to-Image Generation》

1. **Image Inpainting**

# 代表论文：《Deep Image Prior》《EdgeConnect: Generative Image Inpainting with Adversarial Edge Learning》《SC-FEGAN: Face Editing Generative Adversarial Network with User's Sketch and Color》《Free-Form Image Inpainting with Gated Convolution》《Generative Image Inpainting with Contextual Attention》

1. **DeepFake**

代表论文：《DeepFakes and Beyond: A Survey of Face Manipulation and Fake Detection》《Fake Face Detection via Adaptive Residuals Extraction Network》《Deepfake Forensics Using Recurrent Neural Networks》《Detecting Deepfakes with Metric Learning》《Deepfake Video Forensics based on Transfer Learning》

1. **Image Restoration**

代表论文：《Deep Image Prior》《Bringing Old Photos Back to Life》《Noise2Noise: Learning Image Restoration without Clean Data》《Deep Plug-and-Play Super-Resolution for Arbitrary Blur Kernels》《Residual Dense Network for Image Restoration》

1. **Image Captioning**

代表论文：《Show and Tell: A Neural Image Caption Generator》《Bottom-Up and Top-Down Attention for Image Captioning and Visual Question Answering》《Self-critical Sequence Training for Image Captioning》《Unified Vision-Language Pre-Training for Image Captioning and VQA》《Oscar: Object-Semantics Aligned Pre-training for Vision-Language Tasks》

1. **Video Captioning**

代表论文：《VideoBERT: A Joint Model for Video and Language Representation Learning》《Object Relational Graph with Teacher-Recommended Learning for Video Captioning》《Bidirectional Attentive Fusion with Context Gating for Dense Video Captioning》《End-to-End Dense Video Captioning with Masked Transformer》《Controllable Video Captioning with POS Sequence Guidance Based on Gated Fusion Network》

1. **Visual Question Answering**

代表论文：《UNITER: UNiversal Image-TExt Representation Learning》《Multimodal Compact Bilinear Pooling for Visual Question Answering and Visual Grounding》《Multimodal Compact Bilinear Pooling for Visual Question Answering and Visual Grounding》《Show, Ask, Attend, and Answer: A Strong Baseline For Visual Question Answering》《Graph-Structured Representations for Visual Question Answering》

1. **Fine-Grained Image Recognition**

代表论文：《Destruction and Construction Learning for Fine-Grained Image Recognition》《Looking for the Devil in the Details: Learning Trilinear Attention Sampling Network for Fine-grained Image Recognition》《Learning Deep Bilinear Transformation for Fine-grained Image Representation》《Fine-Grained Representation Learning and Recognition by Exploiting Hierarchical Semantic Embedding》《Multi-Attention Multi-Class Constraint for Fine-grained Image Recognition》

1. **Few-Shot Image Classification**

代表论文：《Learning to Remember Rare Events》《Meta-Learning without Memorization》《Leveraging the Feature Distribution in Transfer-based Few-Shot Learning》《Self-Supervised Learning For Few-Shot Image Classification》《Laplacian Regularized Few-Shot Learning》

1. **Semi-Supervised Image Classification**

代表论文：《Semi-Supervised Learning with Context-Conditional Generative Adversarial Networks》《Big Self-Supervised Models are Strong Semi-Supervised Learners》《FixMatch: Simplifying Semi-Supervised Learning with Consistency and Confidence》《EnAET: Self-Trained Ensemble AutoEncoding Transformations for Semi-Supervised Learning》《MixMatch: A Holistic Approach to Semi-Supervised Learning》

1. **Natural Language Adversarial Examples**

代表论文：《Synthetic and Natural Noise Both Break Neural Machine Translation》《HotFlip: White-Box Adversarial Examples for Text Classification》《Generating Natural Language Adversarial Examples》《BAE: BERT-based Adversarial Examples for Text Classification》《Generating Natural Adversarial Examples》

1. **Defenses and Adversarial Training**

代表论文：《Efficient defenses against adversarial attacks》《Obfuscated gradients give a false sense of security: Circumventing defenses to adversarial examples》《Universal adversarial training》《Adversarial Robustness Against the Union of Multiple Perturbation Models》《MACER: Attack-free and Scalable Robust Training via Maximizing Certified Radius》

1. **Gradient Based Attacks**

代表论文：《Intriguing properties of neural networks》《Towards Deep Learning Models Resistant to Adversarial Attacks》《Explaining and Harnessing Adversarial Examples》《Boosting Adversarial Attacks with Momentum》《Towards Evaluating the Robustness of Neural Networks》

1. **Black Box Attacks**

代表论文：《Trust region basedadversarial attackon neural networks》《Universal Adversarial Attack on Attention and the Resulting Dataset DAmageNet》《ZOO: Zeroth Order Optimization Based Black-box Attacks to Deep Neural Networks without Training Substitute Models》《Query-efficient Meta Attack to Deep Neural Networks》《Yet another but more efficient black-box adversarial attack: tiling and evolution strategies》

1. **Self-Supervised Learning**

代表论文：《ALBERT: A Lite BERT for Self-supervised Learning of Language Representations》《A Simple Framework for Contrastive Learning of Visual Representations》《Supervised Contrastive Learning》《Revisiting Self-Supervised Visual Representation Learning》《Time-Contrastive Networks: Self-Supervised Learning from Video》

1. **Emotion Recognition**

代表论文：《EEG-Based Emotion Recognition Using Regularized Graph Neural Networks》《A Novel Bi-hemispheric Discrepancy Model for EEG Emotion Recognition》《Conversational Transfer Learning for Emotion Recognition》《ICON: Interactive Conversational Memory Network for Multimodal Emotion Detection》《DialogueGCN: A Graph Convolutional Neural Network for Emotion Recognition in Conversation》

1. **Image Denoising**

代表论文：《Unprocessing Images for Learned Raw Denoising》《Beyond a Gaussian Denoiser: Residual Learning of Deep CNN for Image Denoising》《Learning Deep CNN Denoiser Prior for Image Restoration》《FFDNet: Toward a Fast and Flexible Solution for CNN based Image Denoising》《High-Quality Self-Supervised Deep Image Denoising》

1. **Crowd Counting**

代表论文：《Context-Aware Crowd Counting》《Bayesian Loss for Crowd Count Estimation with Point Supervision》《From Open Set to Closed Set: Counting Objects by Spatial Divide-and-Conquer》《Crowd counting via scale-adaptive convolutional neural network》《Multi-scale Convolutional Neural Networks for Crowd Counting》

1. **Image Super-Resolution**

代表论文：《Learned Image Downscaling for Upscaling using Content Adaptive Resampler》《Second-Order Attention Network for Single Image Super-Resolution》《Densely Residual Laplacian Super-Resolution》《Image Super-Resolution by Neural Texture Transfer》《Learning Parallax Attention for Stereo Image Super-Resolution》

1. **Image Retrieval**

代表论文：《Fine-grained Visual Textual Alignment for Cross-Modal Retrieval using Transformer Encoders》《Combination of Multiple Global Descriptors for Image Retrieval》《Fashion Image Retrieval with Capsule Networks》《Unifying Deep Local and Global Features for Image Search》《Detect-to-Retrieve: Efficient Regional Aggregation for Image Search》

1. **Scene Graph Generation**

代表论文：《Unbiased Scene Graph Generation from Biased Training》《Factorizable Net: An Efficient Subgraph-based Framework for Scene Graph Generation》《Graph R-CNN for Scene Graph Generation》《Scene Graph Generation from Objects, Phrases and Region Captions》《Knowledge-Embedded Routing Network for Scene Graph Generation》

1. **Recommendation Systems**

代表论文：《Neural Collaborative Filtering》《Collaborative Similarity Embedding for Recommender Systems》《Knowledge-aware Graph Neural Networks with Label Smoothness Regularization for Recommender Systems》《Hierarchical Gating Networks for Sequential Recommendation》《Self-Attentive Sequential Recommendation》

1. **Machine Translation**

代表论文：《DeLighT: Very Deep and Light-weight Transformer》《Improving Neural Language Modeling via Adversarial Training》《Multi-Agent Dual Learning》《Multilingual Denoising Pre-training for Neural Machine Translation》《Attention Is All You Need》

1. **Dialogue Systems**

代表论文：《You Impress Me: Dialogue Generation via Mutual Persona Perception》《Controlling Style in Generated Dialogue》《Towards Empathetic Open-domain Conversation Models: a New Benchmark and Dataset》《ERNIE-GEN: An Enhanced Multi-Flow Pre-training and Fine-tuning Framework for Natural Language Generation》《Multiresolution Recurrent Neural Networks: An Application to Dialogue Response Generation》

1. **Relation Extraction**

代表论文：《A Relation-Specific Attention Network for Joint Entity and Relation Extraction》《Adversarial training for multi-context joint entity and relation extraction》《Relation Extraction as Two-way Span-Prediction》《Double Graph Based Reasoning for Document-level Relation Extraction》《Downstream Model Design of Pre-trained Language Model for Relation Extraction Task》

1. **Reading Comprehension**

代表论文：《Robust Reading Comprehension with Linguistic Constraints via Posterior Regularization》《Cognitive Graph for Multi-Hop Reading Comprehension at Scale》《Multi-hop Reading Comprehension through Question Decomposition and Rescoring》《DuReader: a Chinese Machine Reading Comprehension Dataset from Real-world Applications》《Explore, Propose, and Assemble: An Interpretable Model for Multi-Hop Reading Comprehension》

1. **Text Summarization**

代表论文：《Abstractive Summarization of Spoken andWritten Instructions with BERT》《PEGASUS: Pre-training with Extracted Gap-sentences for Abstractive Summarization》《SummAE: Zero-Shot Abstractive Text Summarization using Length-Agnostic Auto-Encoders》《Better Fine-Tuning by Reducing Representational Collapse》《Get To The Point: Summarization with Pointer-Generator Networks》

1. **Question Answering**

代表论文：《Large-scale Simple Question Answering with Memory Networks》《Open Question Answering with Weakly Supervised Embedding Models》《TANDA: Transfer and Adapt Pre-Trained Transformer Models for Answer Sentence Selection》《Hyperbolic Representation Learning for Fast and Efficient Neural Question Answering》《Dense Passage Retrieval for Open-Domain Question Answering》

1. **Text Style Transfer**

代表论文：《Style Transfer for Texts: Retrain, Report Errors, Compare with Rewrites》《Unsupervised Text Style Transfer using Language Models as Discriminators》《Style Transfer from Non-Parallel Text by Cross-Alignment》《Controllable Artistic Text Style Transfer via Shape-Matching GAN》《Disentangled Representation Learning for Non-Parallel Text Style Transfer》

1. **NLP Pre-training**

代表论文：《XLNet: Generalized Autoregressive Pretraining for Language Understanding》《BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding》《Language Models are Unsupervised Multitask Learners》《ALBERT: A Lite BERT for Self-supervised Learning of Language Representations》《RoBERTa: A Robustly Optimized BERT Pretraining Approach》

1. **Vision-Language Pre-training**

代表论文：《Unified Vision-Language Pre-Training for Image Captioning and VQA》《Oscar: Object-Semantics Aligned Pre-training for Vision-Language Tasks》《Towards Learning a Generic Agent for Vision-and-Language Navigation via Pre-training》《VisualBERT: A Simple and Performant Baseline for Vision and Language》《UNITER: UNiversal Image-TExt Representation Learning》

1. **Graph Neural Networks**

代表论文：《Graph Attention Networks》《Asymmetric Transitivity Preserving Graph Embedding》《Graph Embedding Techniques, Applications, and Performance: A Survey》《graph2vec: Learning Distributed Representations of Graphs》《GL2vec: Graph Embedding Enriched by Line Graphs with Edge Features》

1. **Knowledge Graph Alignment**

代表论文：《Cross-lingual Knowledge Graph Alignment via Graph Matching Neural Network》《Cross-lingual Knowledge Graph Alignment via Graph Convolutional Networks》《Knowledge Graph Alignment Network with Gated Multi-hop Neighborhood Aggregation》《Relation-Aware Entity Alignment for Heterogeneous Knowledge Graphs》《Multi-view Knowledge Graph Embedding for Entity Alignment》