Jie Liang

COMPUTER VISION · MACHINE LEARNING · CLUSTERING · ADVERSARIAL LEARNING

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Education

Nankai University   *Tianjin, China*

Master Candidate IN COLLEGE OF COMPUTER AND CONTROL ENGINEERING, CV LAB   *Sep. 2016 - PRESENT*

- Advisor: **Jufeng Yang**, Associate Professor, Nankai University
- Mentor: **Ming-Ming Cheng**, Professor, Nankai University
- Mentor: **Ming-Hsuan Yang**, Professor, University of California at Merced
- Mentor: **Paul L. Rosin**, Professor, Cardiff University

Ocean University of China   *Qingdao, China*

Bachelor IN SCHOOL OF MATHEMATICAL SCIENCE, INFORMATION AND COMPUTING SCIENCE   *Sep. 2012 - Jun. 2016*

- Major classes: Advanced Algebra, Optimization, Numerical Analysis, Object Oriented Programming, *etc*

Skills

Programming   Python, C/C++

Tools   Matlab, TensorFlow, PyTorch, Caffe, OpenCV, LaTeX, Linux

Publications

Sub-GAN: An Unsupervised Generative Model via Subspaces   *ECCV 2018*

Jie Liang, JUFENG YANG, HSIN-YING LEE, KAI WANG, MING-HSUAN YANG

- Disentangling high-dimensional data into subspaces, generating samples from the low-dimensional embedding

Dynamic Match Kernel with Deep Convolutional Features for Image Retrieval   *TIP (2018)*

JUFENG YANG (ADVISOR), ***Jie Liang***, HUI SHEN, KAI WANG, PAUL L. ROSIN, MING-HSUAN YANG

- Designing dynamic match kernel with deep CNN features, eliminating 99.88% negative matches per query

Clinical Skin Lesion Diagnosis using Representations Inspired by Dermatologist Criteria   *CVPR 2018*

JUFENG YANG (ADVISOR), XIAOXIAO SUN, ***Jie Liang***, PAUL L. ROSIN

- Recognizing skin disease images using interpretable features, showing superior performance against deep architectures

Automatic Model Selection in Subspace Clustering via Triplet Relationships   *AAAI 2018*

JUFENG YANG (ADVISOR), ***Jie Liang***, KAI WANG, YONG-LIANG YANG, MING-MING CHENG

- Automatically estimating the number of clusters and grouping samples with a greedy strategy

Understanding Image Impressiveness Inspired by Instantaneous Human Perceptual Cues

AAAI 2018

Jufeng Yang (Advisor), Yan Sun, *Jie Liang*, Yong-Liang Yang, Ming-Ming Cheng

- Evaluating image property using hybrid deep or hand-craft representations for classification and recommendation

Submitted Papers

2018.04 — **A Unified Framework Based on Triplet Relationships for Joint Model Selection and Subspace Clustering**, Coauthors: Jufeng Yang Ming-Ming Cheng and Paul Rosin — *Submitted to TCYB*

2017.10 — **Subspace Clustering via Good Neighbors**, Coauthors: Jufeng Yang and Ming-Hsuan Yang — *Submitted to TPAMI*

Experiences

Reviewer
CVPR 2018

Emergency Reviewer

- Received **Outstanding Reviewer Award** from CVPR 2018

Volunteers
Tianjin, China

Organizing and Reception

- Computational Visual Media Conference (CVM 2017); China Conference on Computer Vision (CCCV 2017)

Honors & Awards

Scholarship & Honor

2014 — **National Motivational Scholarship,** first class — *China*

2015 — **Outstanding Student Honor**, Valuable honor in OUC — *China*

Awards

2015 — **China Undergraduate Mathematical Contest in Modeling**, First Class Award at the provincial level — *China*

Projects

1. Sparse Subspace Clustering
CV Lab

Idea & Reference Investigation & Coding & Paper Writing
Jul. 2016 - PRESENT

- Based on the *similarity matrix* derived by optimizing a **self-representation** problem
- Exploring comprehensive **regularization term** by computing the trade-off between *sparsity* and *grouping effect*
- Getting SOA result on all evaluated datasets, submitting to **TPAMI**
- Proposing a greedy strategy to simultaneously estimate the number of clusters and grouping, inspired by the **block-diagonal** structure of similarity matrix
- Designing a **triplet** relationship and two rewards, getting SOA result and saving **30%** time consumption, accepted by **AAAI 2018**
- Trying to extended it to large-scale unsupervised applications, e.g., millions-scale image clustering, with greedy neighboring strategy

2. Generative Adversarial Networks *CV Lab*

IDEA & REFERENCE INVESTIGATION & CODING & PAPER WRITING   *Apr. 2017 - PRESENT*

- Simultaneously learning the **subspaces** of ambient space and conducting the **adversarial training**, to conquer the training instability and mode collapse
- **Generator** takes eigenvectors of subspaces as constraint, **discriminator** predicts both realness and subspaces for each sample
- Incorporating a **clusterer** to iteratively update both the clustering assignments and the eigenvectors of subspaces
- Designing a unified optimization function for **joint training** of the three modules, submitted to **CVPR 2018**

3. Low-Level Vision Application of Adversarial Training *CV Lab*

IDEA & REFERENCE INVESTIGATION & CODING & PAPER WRITING   *Dec. 2017 - PRESENT*

- Utilizing the adversarial training strategy to **optimize** various low-level vision problems, *e.g.*, semantic segmentation, super resolution, style transfer, image deblurring, *etc*
- Modifying network **implementation** of various tasks in TensorFlow

4. Clinical Skin Lesion Recognition *CV Lab*

CODING & PAPER WRITING   *Apr. 2017 - Dec. 2017*

- Designing comprehensive features inspired by **human knowledge**, i.e., Dermatologist criteria, to improve the recognition
- Based on SD-198 dataset with 3000+ training images of **198 diseases**
- Comparing with various basic low-level representations and deep features, achieving SOA result, accepted by **CVPR 2018**
- A **web application** for recognizing clinical skin diseases is released for public welfare

5. Deep Content based Image Retrieval *CV Lab*

REFERENCE INVESTIGATION & CODING & PAPER WRITING   *Apr. 2017 - Dec. 2017*

- Designing a semantic-constrained framework with dynamic match kernels, incorporating global similarity from **deep CNN features**
- Exploring optimized combination of **post-processing** modules, e.g., local descriptors aggregation, graph based re-ranking, to enhance the performance. Getting the SOA result and submitting to **TIP**
- Also show best performance on retrieval tasks with 1 million + image distractors
- Eliminated **99.88%** negative matches per query and saved **88%** time consumption (0.89s/7.33s) due to the **dynamic** strategy

6. Image Property Exploration *CV Lab*

REFERENCE INVESTIGATION & CODING & PAPER WRITING   *Apr. 2017 - Oct. 2017*

- Measuring image property with quantitative visual features, which includes both **low-level** and **deep** semantic representations
- Utilizing **feature fusion** techniques, e.g., multi-kernel learning, etc, to generate hybrid representation for classification
- Designing an enhanced recommendation system which can **re-rank** the candidates based on the evaluation of impressiveness