NIE Xuecheng

Vision and Machine Learning Lab;
#08-24, Block E4, 4 Engineering Drive 3;
National University of Singapore;
Singapore, 117583.

Email: niexuecheng@u.nus.edu
Homepage: https://niexc.github.io
Github: https://github.com/NieXC
Tel: +65-91208242

Education

- **National University of Singapore**, Singapore
  - **Ph.D.** in Department of Electrical and Computer Engineering 2016.08-Present
    Supervisor: Assis. Prof. FENG Jiashi and Assoc. Prof. YAN Shuicheng
- **Tianjin University**, Tianjin, China
  - **M.Eng.** in School of Computer Software 2012.09-2015.01
    Supervisor: Prof. FENG Wei
  - **B.Eng.** in School of Computer Software 2008.09-2012.06

Research Interests

- Computer Vision, Deep Learning, Human Pose Estimation, Human Shape Recovery.

Publications

- **Refereed Conference Papers**

  [C15] **Xuecheng Nie**, Yuncheng Li, Jiashi Feng, Menglei Chai, Zehao Xue, Chen Cao, "Neural Chest Capture Machines", submitted to *Conference on Neural Information and Processing System (**NeurIPS**)* 2019.

  [C14] Jianfeng Zhang*, **Xuecheng Nie***, Hongsong Wang, Pan Zhou Jiashi Feng, "Nested Graph Auto-Encoder for 3D Human Pose Estimation", submitted to *Conference on Neural Information and Processing System (**NeurIPS**)* 2019. (* indicates equal contribution)

  [C13] **Xuecheng Nie**, Jiashi Feng, Jianfeng Zhang, Shuicheng Yan, "Single-stage Multi-person Pose Machines", in *IEEE Int. Conf. on Computer Vision (**ICCV**)* 2019.

  [C12] **Xuecheng Nie**, Yuncheng Li, Linjie Luo, Ning Zhang, Jiashi Feng, "Dynamic Kernel Distillation for Efficient Pose Estimation in Videos", in *IEEE Int. Conf. on Computer Vision (**ICCV**)* 2019.

  [C11] Zhiyu Tan, **Xuecheng Nie**, Qi Qian, Nan Li, Hao Li, "Learning to Rank Proposals for Object Detection", in *IEEE Int. Conf. on Computer Vision (**ICCV**)* 2019.

  [C10] **Xuecheng Nie**, Jiashi Feng, Junliang Xing, Shuicheng Yan, "Pose Partition Networks for Multi-Person Pose Estimation", in *European Conference on Computer Vision (**ECCV**)* 2018.

  [C9] **Xuecheng Nie**, Jiashi Feng, Shuicheng Yan, "Mutual Learning to Adapt for Joint Human Parsing and Pose Estimation", in *European Conference on Computer Vision (**ECCV**)* 2018.

  [C8] **Xuecheng Nie**, Jiashi Feng, Yiming Zuo, Shuicheng Yan, "Human Pose Estimation with Parsing Induced Learner", in *IEEE Int. Conf. on Computer Vision and Pattern Recognition (**CVPR**)* 2018.

  [C7] Shengtao Xiao, Jiashi Feng, Luoqi Liu, **Xuecheng Nie**, Wei Wang, Ashraf A. Kassim, "Recurrent 3D-2D Dual Learning for Large-Pose Facial Landmark Detection", in *IEEE Int. Conf. on Computer Vision (**ICCV**)* 2017.

  [C6] Jian Zhao, Jianshu Li, **Xuecheng Nie**, Fang Zhao, Yunpeng Chen, Zhecan Wang, Jiashi Feng, Shuicheng Yan, "Self-Supervised Neural Aggregation Networks for Human

Parsing", in *IEEE Int. Conf. on Computer Vision and Pattern Recognition Workshops (**CVPR Workshops**)* 2017.

[C5] Shengtao Xiao, Luoqi Liu, **Xuecheng Nie**, Jiashi Feng, Ashraf A. Kassim, Shuicheng Yan, "A Live Face Swapper", in *ACM Multimedia Conference (**MM**)* 2016.

[C4] **Xuecheng Nie**, Wei Feng, Liang Wan, Haipeng Dai, and Chi-Man Pun, "Intrinsic Image Decomposition by Hierarchical L0 Sparsity", in *IEEE Int. Conf. on Multimedia and Expo (**ICME**)*, pp. 1-6, Jul. 2014.

[C3] Haipeng Dai, Wei Feng, Liang Wan, and **Xuecheng Nie**, "L0 Co-Intrinsic Image Decomposition", in *IEEE Int. Conf. on Multimedia and Expo (**ICME**)*, pp. 1-6, Jul. 2014.

[C2] **Xuecheng Nie**, Wei Feng, Liang Wan, and Lei Xie, "Measuring Semantic Similarity by Contextual Word Connections in Chinese News Story Segmentation", in *IEEE Int. Conf. on Acoustics, Speech and Signal Processing (**ICASSP**)*, pp. 8312-8316, May 2013.

[C1] Wei Feng, **Xuecheng Nie**, Liang Wan, Lei Xie, and Jianmin Jiang, "Lexical Story Co-Segmentation of Chinese Broadcast News", in *13th Annual Conf. on the Int. Speech Communication Association (**INTERSPEECH**)*, pp. 2286-2289, Sep. 2012.

- **Refereed Journal Papers**

[J4] **Xuecheng Nie**, Jiashi Feng, Junliang Xing, Shengtao Xiao, Shuicheng Yan, "Hierarchical Contextual Refinement Networks for Human Pose Estimation", *IEEE Trans. on Image Processing*, 2018.

[J3] Wei Feng, **Xuecheng Nie**, Yujun Zhang, Zhi-Qiang Liu, Jianwu Dang, "Story Co-segmentation of Chinese Broadcast News Using Weakly-supervised Semantic Similarity", *Neurocomputing*, 2019.

[J2] Wei Feng, **Xuecheng Nie***, Yujun Zhang, Lei Xie, Jianwu Dang, "Unsupervised Measure of Chinese Lexical Semantic Similarity Using Correlated Graph Model for News Story Segmentation", *Neurocomputing*, 2018 (* indicates corresponding author)

[J1] Yan Zheng, **Xuecheng Nie**, Zhaopeng Meng, Wei Feng, and Kang Zhang, "Layered Modeling and Generation of Pollock's Drip Style", *The Visual Computer*, vol. 31, no. 5, pp. 589-600, 2015.

- **Patents**

[P2] Wei Feng, **Xuecheng Nie**, Ang Yang, and Jianwu Dang, "A Data-Driven Method for Calculating Semantic Similarity of Chinese Words", Publication No. CN103761225 A, Mar. 2017.

[P1] Wei Feng, Liang Wan, **Xuecheng Nie**, Xiaoni Gao, Jianwu Dang, "A Soft Semantic Similarity Measurement for Chinese News Story Segmentation", Publication No. CN103793491 B, Jan. 2017.

Work Experience

- **Research intern at Google Cloud AI** 2019.06-2019.12
- **Research intern at Snap Inc.** 2018.05-2018.08
- **Intern at Qihoo 360 AI Institute** 2015.09-2016.05
- **Research Assistant at City University of Hong Kong** 2014.05-2014.08

Research Experience

- **Neural Chest Capture Machines** 2018.12-2019.05

Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
Mentor: Research Scientist, LI Yuncheng and CAO Chen, Snap Inc.

- Proposed a new and promising task Monocular Chest Capture
- Proposed a novel nonlinear model to recovery pose and shape of human chest
- Collect a large-scale 3D chest capture dataset

- Submitted a first-authored refereed paper in NIPS 2019

- **Nested Graph Auto-Encoder for 3D Human Pose Estimation** 2019.02-2019.05
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed a novel model to learn 3D structural representation of human skeleton
  - Proposed a novel hierarchical graph convolution network model
  - Proposed a novel weakly-supervised learning strategy
  - Submitted a first-authored refereed paper in NIPS 2019
- **Dynamic Kernel Distillation for Efficient Pose Estimation in Video** 2018.05-2018.11
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  Mentor: Research Scientist, LI Yuncheng, Snap Inc.
  - Proposed a novel model to facilitate small networks in video-based pose estimation
  - Proposed the first temporally adversarial training strategy
  - Achieved superior efficiency and accuracy on multiple benchmarks
  - Published a first-authored refereed paper in ICCV 2019
- **Single-stage Pose Machines for Multi-Person Pose Estimation** 2018.02-2018.06
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed the first single-stage solution to multi-person 2D/3D pose estimation
  - Proposed a novel Structured Pose Representation to unify position of person and joint
  - Achieved superior efficiency with competitive accuracy on multiple benchmarks
  - Published a first-authored refereed paper in ICCV 2019
- **MuLA for Joint Human Parsing and Pose Estimation** 2017.12-2018.03
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed a novel end-to-end model for joint human parsing and pose estimation
  - Proposed a novel mutual adaptation module for dynamic interactions between tasks
  - MuLA is capable of iteratively exploiting mutual guidance info
  - Achieved new state-of-the-art on multiple benchmarks
  - Published a first-authored refereed paper in ECCV 2018
- **Human Pose Estimation with Parsing Induced Learner** 2017.05-2017.11
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed a novel model for learning to adapt pose model by using parsing info
  - The proposed Parsing Induced Learner is transferable across datasets
  - Achieved new state-of-the-art on multiple benchmarks for human pose estimation
  - Published a first-authored refereed paper in CVPR 2018
- **Generative Partition Network for Multi-Person Pose Estimation** 2017.02-2017.09
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed a new one-pass solution to multi-person pose estimation
  - Proposed a novel dense regression module for efficient and robust joint partition
  - Achieved new state-of-the-art on multiple benchmarks
  - Published a first-authored refereed paper in ECCV 2018
- **Complexity-Aware CNN Model for Single-Person Pose Estimation** 2016.08-2016.12
  Supervisor: Assis. Prof FENG Jiashi, National University of Singapore
  - Proposed a principled way to deal with heterogeneous complexities of body joints
  - Introduced a Contextual Refinement Unit for exploiting contextual information
  - Achieved superior performance and high efficiency
  - Written a refereed paper, which has been submitted to TIP (under review)
- **Realtime Face Detection for Mobile Devices** *(Intern)* 2016.02-2016.05
  Supervisor: Assoc. Prof YAN Shuicheng, Qihoo 360 AI Institute

- Implemented the Fast-RCNN based realtime face detector for mobile devices
- Simplified CNN architecture for computation acceleration and model size reduction
- Implemented the Cross- and X-Shape convolution for further acceleration
- Successfully applied to both Android and IOS systems with speed of 20fps

○ **Deep Neural Network for Face Analysis** (*Intern*) 2015.09-2015.12
Supervisor: Assoc. Prof. YAN Shuicheng, Qihoo 360 AI Institute
- Improved face recognition accuracy on benchmark datasets
- Implemented Cascade Convolutional Neural Network for face detection
- Constructed and trained Siamese network for face verification

○ **Weakly-Supervised Semantic Similarity** (*Research Assistant*) 2014.05-2014.08
Supervisor: Prof. LIU Zhi-Qiang, City University of Hong Kong
- Implemented weakly-supervised semantic similarity measurement
- Improved performance of story co-segmentation with soft semantic similarity
- Written a refereed paper, which has been submitted to TASLP (under review)

○ **Hierarchical L0 Sparsity for Intrinsic Image Decomposition** 2013.09-2014.12
Supervisor: Prof. FENG Wei, Tianjin University
- Constructed global correlations among pixels in images by L0 sparsity
- Implemented coarse-to-fine process to propagate correlations by hierarchical model
- Achieved superior performance on intrinsic image decomposition task
- Published a first-authored refereed paper in ICME 2014

○ **Measuring Semantic Similarity for Chinese Words** 2012.06-2014.12
Supervisor: Prof. FENG Wei, Tianjin University
- Constructed correlated affinity graph embedding semantic relationships
- Implemented an iterative affinity propagation to generate semantic similarities
- Extended cosine similarity to encode latent correlations between different words
- Achieved 7%~10% F1-measure improvement on benchmark datasets
- Published a first-authored refereed paper in ICASSP 2013

○ **Story Co-Segmentation for Document Analysis** 2011.12-2012.09
Supervisor: Prof. FENG Wei, Tianjin University
- Proposed the concept of story co-segmentation to extract stories of the same topics
- Proposed a four-step iterative solution based on Markov Random Field
- Designed a feasible criterion for common lexical cluster selection
- Published a second-authored refereed paper in INTERSPEECH 2012

Awards and Honors

○ **1st place** in object localization tracks in ILSVRC 2017 2017.06
○ **2nd place** in 1st LIP Challenges on Human Parsing and Pose Estimation 2017.05
○ **Hong Kong Ph.D. Fellowship** 2016.03
○ **Excellent Postgraduate** of Tianjin University (**Top 2%** / all TJU students) 2015.01
○ **National Scholarship** for Graduate Students (**Top 1%** / all TJU students) 2014.12
○ **Google Excellence Scholarship** (**Top 2** / all TJU.SCS students) 2013.06
○ **Excellent Undergraduate** of Tianjin University (**Top 2%** / all TJU students) 2012.06
○ **TEDA-Scope Scholarship** (**Top 5%** / all TJU.SCS students) 2012.06
○ **First Prize** for SCS Innovation Fund (**Top 1** / all TJU.SCS students) 2011.06

Professional Activities

○ **Serviced as a reviewer for the following journal and conferences:**
- Elsevier Journal of Neurocomputing

- Elsevier Journal of Computer Vision and Image Understanding
- IEEE Transactions on Multimedia
- Journal of Artificial Intelligence Research
- CVPR, ICCV, AAAI

○ **Teaching Assistant at National University of Singapore** 2017.01-2018.05
- EE2024: Programming for Computer Interfaces

Skills

○ **Programming Skills**
- C/C++, Python, MATLAB, C#, and LaTeX

○ **Deep Learning Frameworks**
- Caffe and Pytorch

○ **Tools**
- Linux Shell, Vim, Visual Studio, and MATLAB