

Shuai Zheng *Curriculum Vitae*

Summary (<https://kylezheng.org/>)

Shuai (Kyle) Zheng is a research scientist at CoreAI team, eBay Inc, where he work on both fundamental and practical problems in Computer Vision and Deep Learning. He has 10+ years research experience and published [20+ technical papers](#) at the top conferences and journals including ACM TOG (SIGGRAPH), IEEE SPM, ACM Multimedia, PR, CGF, CVPR, ICCV, and ECCV, etc. He is an active reviewer and program committee for 20+ premier journals and conferences including CVPR, ICCV, ACM SIGGRAPH, ACCV, AAAI and etc. He has completed DPhil at the University of Oxford and supervised by Prof. Philip H. S. Torr.

Research Experience

06/2018–present Research Scientist 2/Tech Lead, eBay Core AI, San Jose, CA, United States

Lead the projects on: a) Life-long learning using Google Cloud TPUv2 Pod; b) object detection and segmentation for shop-the-look experience; c) Personalized banner image generation and recommendation using semantic image segmentation and deep reinforcement learning.

Contribute to: a) eBay Krylov 2.0 AI Platform; b) machine learning models for the visual search feature at eBay app and eBay public API.

01/2017–06/2018 Research Scientist, eBay Core AI, San Francisco, CA, United States

Lead the projects on: a) Performance evaluation on Google Cloud TPUv2. b) camera-as-commerce-platform iOS app; c) semantic image segmentation for shop-the-look; d) contribute to the visual search feature on eBay Shop-Bot/Facebook Messenger; e) object recognition model for a sneaker-timeline iOS app.

Mentor three PhD interns on the projects including large-scale object detection, GANs and reinforcement learning.

07/2014–09/2014 Research Intern, Institute of Deep Learning, Baidu, Beijing, P.R.China

Topic: Low-level vision problem solution with deep convolutional neural networks

Mentor: Dr. [Chang Huang](#)

12/2013 Research Visitor, TU Dresden, Dresden, Germany

Topic: Semantic Image Understanding

Collaborator: Prof. [Carsten Rother](#)

2011-2013 Research Assistant, Oxford Brookes Vision Group, Oxford, United Kingdom

Topic: Scene Understanding using New Global Energy Models

Supervisor: Prof. [Philip H.S. Torr](#)

Education

10/2013–11/2016 DPhil (PhD), University of Oxford, Oxford, United Kingdom

Topic: *Holistic image understanding with deep learning and dense random fields*

Supervisor: Prof. [Philip H.S. Torr](#)

09/2008–07/2011 M.Eng, National Laboratory of Pattern Recognition, Chinese Academy of Sciences, Beijing, P.R.China.

GPA: 85/100

Thesis: *Mid-level feature representation learning for object recognition.*

Supervisors: Prof. [Kaiqi Huang](#) and Prof. [Tieniu Tan](#)

09/2004-06/2008 B.Eng, Information Engineering in Opto-electronics, Beijing Institute of Technology, Beijing, P.R.China.

GPA: 89/100 (top 1%)

Selected Publications

Papers: [[Google scholar citations](#)]

B. A. Plummer, M. H. Kiapour, **S. Zheng**, and R. Piramuthu. Give me a hint! navigating image databases using human-in-the-loop feedback. In *WACV*, 2019. arXiv:1809.08714.

M. Larsson, A. Arnab, **S. Zheng**, and F. Kahl P.H.S. Torr. Revisiting deep structured models for pixel-level labeling with gradient-based inference. *SIAM Journal on Imaging Sciences*, (4):2610–2628, 2018.

S. Zheng, F. Yang, H. Kiapour, and R. Piramuthu. Modanet: Modanet: A large-scale street fashion dataset with polygon annotations. In *ACM MM*, 2018. (oral).

H. Wu **S. Zheng**, J. Zhang, and K. Huang. Fast end-to-end trainable guided filter. In *CVPR*, 2018.

B. Plummer, P. Kordas, M. Kiapour, **S. Zheng**, R. Piramuthu, and S. Lazebnik. Conditional image-text embedding networks. In *ECCV*, 2018.

- A. Arnab*, **S. Zheng***, M. Larsson A. Kirillov B. Savchynskyy C. Rother F. Kahl S. Jayasumana, B. Romera-Paredes, and P. H. S. Torr. Conditional random fields meet deep neural networks for semantic segmentation. *IEEE Signal Processing Magazine*, (1):37–52, 2018. (Special Issue in Deep Learning for Visual Understanding Recent Advances Part II, *indicates the joint first authors.).
- H. Wu, **S. Zheng**, J. Zhang, and K. Huang. Gp-gan: Towards realistic high-resolution image blending. In *arXiv*, 2017. technical report.
- J. Thewlis, **S. Zheng**, P.H.S. Torr, and A. Vedaldi. Fully-trainable deep matching. In *BMVC*, 2016. (oral).
- A. Arnab, S. Jayasumana, **S. Zheng**, and P.H.S. Torr. Higher order potentials in end-to-end trainable conditional random fields. In *ECCV*, 2016.
- A. Kirillov, D. Schlesinger, **S. Zheng**, B Savchynskyy, P.H.S. Torr, and C. Rother. Efficient likelihood learning of a generic cnn-crf model for semantic segmentation. In *ACCV*, 2016.
- S. Zheng**, V. Prisacariu, M Averkiou, M. Cheng, N. Mitra, J. Shotton, P.H.S. Torr, and C. Rother. Object proposal estimation in depth images using compact 3D shape manifolds. In *German Conference on Pattern Recognition*, 2015. (oral).
- M.M. Cheng, V. A. Prisacariu, **S. Zheng**, P.H.S. Torr, and C. Rother. Densecut: densely connected CRFs for realtime GrabCut. *Computer Graphics Forum*, 34(7), 2015. (oral and special issue in journal).
- S. Zheng***, S. Jayasumana*, B. Romera-Paredes, V. Vineet, Z. Su, D. Du, C. Huang, and P.H.S. Torr. Conditional random fields as recurrent neural networks. In *IEEE International Conference on Computer Vision IEEE ICCV*, 2015. (*indicates the joint first authors.).
- M.M. Cheng*, **S. Zheng***, W.Y. Lin, V. Vineet, P. Sturgess, N. Crook, N.J. Mitra, and P.H.S. Torr. ImageSpirit: verbal guided image parsing. *ACM Transactions on Graphics (TOG)*, 2014. (*indicates the joint first authors.).
- S. Zheng**, M.M. Cheng, J. Warrell, P. Sturgess, V. Vineet, C Rother, and P.H.S. Torr. Dense semantic image segmentation with objects and attributes. In *IEEE International Conference on Computer Vision and Pattern Recognition IEEE CVPR*, 2014.
- M.M. Cheng, J. Warrell, W.Y. Lin, **S. Zheng**, V. Vineet, and N. Crook. Efficient salient region detection with soft image abstraction. In *IEEE International Conference on Computer Vision IEEE ICCV*, 2013.
- W.Y. Lin, M.M. Cheng, **S. Zheng**, J. Lu, and N. Crook. Robust non-parametric data fitting for correspondence modeling. In *IEEE International Conference on Computer Vision IEEE ICCV*, 2013.
- S. Zheng**, P. Sturgess, and P.H.S. Torr. Approximate structured output learning for constrained local models with application to real-time facial feature detection and tracking on low-power devices. In *IEEE International Conference on Automatic Face and Gesture Recognition IEEE FG*, 2013.
- S. Zheng**, K. Huang, T. Tan, and D. Tao. A cascade fusion scheme for gait and cumulative foot pressure image recognition. *Pattern Recognition*, 45(10):3603–3610, 2012.
- S. Zheng**, J. Zhang, K. Huang, R. He, and T. Tan. Robust view transformation model for gait recognition. In *IEEE International Conference on Image Processing IEEE ICIP*, 2011.
- S. Zheng**, B. Xie, D. Tao, and K. Huang. Multi-view pedestrian recognition using shared dictionary learning with group sparsity. In *International Conference on Neural Information Processing ICONIP*, 2011. (oral).
- J. Zhang, Y. Yu, **S. Zheng**, and K. Huang. An empirical study of visual features for part based model. In *Asian Conference on Pattern Recognition ACPR*, 2011.
- Four US patent applications with eBay:** 1) Camera Platform and Object Inventory Control, IP-P3342PRV; 2) Intelligent online personal assistant with image text localization, IP-P3301WO1. 3) Computer Vision for e-Commerce, IP-P3379PRV. 4) Personalized banner image generation and recommendation using semantic image segmentation and deep reinforcement learning.

Major Honors & Awards

- 2018 **Critical Talented Award** and **Spot Award** at eBay Inc. (Top 5% employees across the whole company)
- 2017 **Honorable mentioned award** at eBay Skunkworks Expo.
- 2016 **Finalist** at [LDV Vision Summit Entrepreneur Computer Vision Challenge](#).
- 2015 **Best demo award** at [IEEE ICCV](#) for a [live demo website for semantic image segmentation](#).
- 2014 **Runner-up** for an iOS app ([Deep ALE](#)) from [the 1st Oxford Hackathon](#).
- 2010 **Winner** in [object detection in PASCAL VOC Challenge](#), European Union funded PASCAL2.
- 2007 **Recipient** of T-more outstanding innovation student award, Beijing Institute of Technology. (¥10,000, top 4/3600+.)
- 2007 **Recipient** of the 1st prize award in "Challenge Cup": Philips National academic science and technology competition for college students, Ministry of Education of The People's Republic of China etc.
- 2007 **Winner** in Web development, Microsoft Imagine Cup, Microsoft. (the 4th place in worldwide final, the 1st place in China)

Highlighted Research Experience

Large-scale image recognition with Cloud TPU Pod: This project harnesses the capabilities of 11.5 petaflops Google Cloud TPU Pod v2 for large-scale product image recognition. The deep neural network architecture is learned from evolution-based approach. Our

final model is more than 10% more accurate than the baseline, and the best training time is almost $100\times$ faster than the industrial standard hardware. This [work](#) has been featured at Google chief scientist [Fei-Fei Li's keynote](#) as well as [eBay VP Larry Colagiovannis talk](#) at Google Next 2018.

Semantic image segmentation with CRF-RNN: This work demonstrates that the filtering-based mean-field approximate inference method can be reformulated as recurrent neural networks, which can be plugged into a deep convolutional neural network to obtain an end-to-end system that has desirable properties of both CNNs and CRFs. Our approach has obtained the state-of-the-art comparable results in semantic image segmentation comp6 task in PASCAL VOC 2010-2012. The technique report is published in ICCV 2015. The demo website has won the best demo award in ICCV 2015. This project is sponsored by [EPSRC](#) and [ERC](#).

Gait recognition: This project provides an evaluation framework for gait and foot pressure image recognition research. There are total 500+ download request per year from worldwide, as of June 2011. Results are published in ICIP 2011 and Pattern Recognition.

Object detection: This work involves improving the state-of-the-art object detector deformable part-based model with feature learning approach. The proposed algorithm has shown strong results at the time, especially [winning the object detection task](#) in PASCAL VOC Challenge 2010. In this project, I was involved in the PASCAL VOC Challenge 2010 NLP submissions for object detection and object-based image classification. This project is sponsored by [NSFC](#) and [973](#).

Engineering Skills

[GitHub Profile](#). My primary programming languages are *Python*, *C++/C*. I have more-than-1-years experience with *Objective-C*, *Java*, and *Swift*. I also have hands-on experience with *Caffe1/2*, *Tensorflow*, *Keras*, *Pytorch*, *OpenCV*, *Git*, *AWS*, *Google Cloud*, *Google Cloud TPU v2* and *TPU v2 Pod* and *Docker*.

Professional Activities

Reviewer for Journals: IEEE PAMI, MM TIP, SMC Part B, TCSVT, TSP, TNNLS SPL Elsevier CVIU, JVCIR, NEUCOM, PR, PRL NPL SP, Springer COA.

Reviewer or Program Committee for Conferences: CVPR 2019, AAAI 2019, ACCV 2019, ACM MM 2018, ACM SIGGRAPH 2018, ACCV 2018, ICCV2017, ACM MM2017, ICRA2017, CVM2017, ACCV2016, ACCV2014, NIPS2016, CCIVS2016, ICMLA2012. ACPR2011, ICPR2011, ICIP2010.

VALSE (Vision and Learning Seminar) online organization committee, 2015-2016.

Member of ACM, BMVA, IEEE, CVF.

Organizer of Weakly Supervised Learning for Real-World Computer Vision Applications and the 1st Learning from Imperfect Data (LID) Challenge, CVPR 2019.

Mentored Interns & collaborators

Tianlu Wang, University of Virginia, summer 2018.

Bryan Plummer, University of Illinois Urbana-Champaign, summer 2017.

Omid Poursaeed, Cornell Tech, summer 2017.

Huikai Wu, Graduate University Chinese Academy of Sciences.

References

reference will be provided upon request.

February 18, 2019