Khoi Nguyen

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Oregon State University

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g Google Scholar

Research interests: Computer Vision, Deep Learning, Machine Learning

EDUCATION

Fall 2017 – Spring 2021 (expected)

Ph.D. in Computer Science

Oregon State University, Corvallis, OR 97331, USA
- Research Interest: Computer Vision, Machine Learning
- Advisor: Prof. Sinisa Todorovic

Fall 2015 – Summer 2017

Master of Science in Computer Science

Oregon State University, Corvallis, OR 97331, USA
- Thesis: "Relational Networks for Visual Relationship Detection",
- Advisor: Prof. Sinisa Todorovic (GPA 3.71/4)

Fall 2009 – Spring 2014

Bachelors's degree in Computer Science

Bach Khoa University (HCMUT), HCMC, Vietnam
- Thesis: "Entity Disambiguation System based on Wikipedia", advisor: Prof. Tru Cao
- Top-5 student in Computer Science Program (total 330 students), (GPA 8.51/10)

PUBLICATIONS

Conferences
- Khoi Nguyen, Sinisa Todorovic, "Feature Weighting and Boosting for Few-Shot Segmentation", in International Conference on Computer Vision (ICCV), 2019
- Khoi Nguyen, Sinisa Todorovic, "A Self-supervised GAN for Unsupervised Few-shot Object Recognition", in International Conference on Pattern Recognition (ICPR), 2020

PROFESSIONAL ACTIVITIES

Conferences
- Reviewer for ECCV 2020 (top 215 reviewers)

SKILLS/ EXPERIENCE

Research Experience
- **Unsupervised Few-shot Learning** (2019), we address the problem of unsupervised few-shot learning where all training images are unlabeled and do not share classes with labeled support images for few-shot classification in testing. We use a new GAN-like deep architecture aimed at unsupervised learning of an image representation which will encode latent object parts and thus generalize well to unseen classes in our few-shot recognition task.
- **Few-shot Semantic Segmentation** (2019), we address the problem of few-shot object segmentation, where the goal is to segment a query image, given a support image and the support's ground-truth segmentation. We make two contributions. First, we have formulated an optimization problem that encourages high feature responses on the foreground and low feature activations on the background for more accurate object segmentation. Second, we have specified the gradient boosting of our model for fine-tuning to new classes in testing.
- **Few-shot Instance Segmentation** (2020), we address the problem of few-shot instance segmentation, where the training and test settings do not share the same object classes. We specify and evaluate a new few-shot anchor-free part-based instance segmenter FAPIS. Our key novelty is in explicit reasoning about layouts of latent object parts for instance segmentation.

Side Experience	• **Pytorch Autograd** (Python, Pytorch), a reimplementation of Pytorch's autograd mechanism (replacement of graph computation of tensorflow). Given any expressions/formulations, we can automatically compute the gradient of output with respect to any particular intermediate variables or input. We just used Pytorch's tensor (not variable) - https://github.com/ducminhkhoi/autograd_pytorch
	• **Pytorch Grad-CAM** (Python, Pytorch), Grad-CAM in Pytorch, which is the most popular framework for explaining the prediction of a DNN regardless of its output's form (can be image's label, image description or question answer) - https://github.com/ducminhkhoi/pytorch-grad-cam
	• **Torch-ML** (Python, Pytorch), Re-implement some popular machine learning algorithms like GMM, SVM, Gaussian Processes and so on which have differentiable objective functions in Pytorch) https://github.com/ducminhkhoi/torch-ml
Internship Experience	**Verisk Analytics** - the AI Innovation Lab, Jersey City, New Jersey, USA (Summer 2018)
	• Apply Graph Neural Network to image document analysis for extracting semi-structured information (W2 Form)
	• Mentor: Dr. Maneesh Singh
	• Result: Improve the current performance on synthetic dataset above 90 percent of accuracy, much better than baseline using CRF.
	AIBee US Corp - Palo Alto, CA, USA (Summer 2019)
	• Multi-person Tracking by Segmentation in Surveillance Camera
	• Mentor: Dr. Chunhui Gu, Dr. Sinisa Todorovic, Dr. Silvio Savarese
	• Result: Improve the MOT performance about 5% over tracking by detection.
Programming Languages	Python - Professional (daily use)
	• Deep Learning frameworks: Pytorch, Keras, TensorFlow
	• Scientific frameworks: Numpy, Scipy, Matplotlib, Scikit-learn

ADDITIONAL INFORMATION

References	References upon request
Awards/Scholarships	Vietnam Education Foundation (VEF) Fellowship (Cohort 2015)
Interests	Exercise, Meditation, Group Activity, Sharing Knowledge