

Sadegh ALIAKBARIAN

Computer Vision and Machine Learning Researcher | PhD Student

🔗 <https://scholar.google.com/citations?user=1qXJQ7cAAAAJ> 📞 +61 406945908 @ s.aliakbarian@gmail.com

EDUCATION

Now July 2016	PhD in Computer Science The Australian National University, CANBERRA, Australia ➤ Thesis : Deep Sequence Learning for Video Anticipation : From Deterministic to Stochastic
September 2013 October 2009	B.Sc. in Computer Software Engineering Isfahan University of Technology, ISFAHAN, Iran ➤ Thesis : Machine Learning Techniques for Internet Traffic Classification

(RECENT) PROFESSIONAL EXPERIENCE

Now November 2017	Associate Researcher Australian Centre for Robotic Vision (ACRV), CANBERRA, Australia ➤ Research area : Generative models, with the focus on VAEs and conditional VAEs ➤ Building SotA generative model to predict multiple plausible continuations of human motions. ➤ Building a generative model that mitigates posterior collapse in conditional generative models. ➤ Outcome : NeurIPS 2019 submission, ICCV 2019 Submission PyTorch Python Generative Models Sequence Learning
October 2018 May 2018	Computer Vision Research Engineering Intern Qualcomm AI Research, AMSTERDAM, The Netherlands ➤ Research area : Sequence analysis for human intention forecasting by analysing motion. ➤ Designing efficient human motion representation for human motion prediction. ➤ Building SotA deterministic human motion prediction. ➤ Outcome : Two US Patent submissions, ICCV 2019 Submission PyTorch tf.Keras Python Sequence Learning Docker
March 2016 June 2015	Machine Learning Research Intern National ICT Australia (NICTA), CANBERRA, Australia ➤ Research area : Urban scene semantic segmentation under various illuminations. ➤ Designing domain (daytime) invariant deep semantic segmentation network. ➤ Designing weakly-supervised semantic segmentation given only image/video-level tags. ➤ Outcome : An ECCV 2016 and a TPAMI papers (continuing collaboration resulted in ICCV 2017 and ECCV 2018 papers). tf.Keras Torch Lua Python Deep Learning

(RECENT) PUBLICATIONS

NeurIPS 2019	S. Aliakbarian, F. Saleh, M. Salzmann, L. Petersson, <i>Stochastic Human Motion Prediction via CPP-VAEs</i> (Submitted to)
ICCV 2019	S. Aliakbarian, F. Saleh, M. Salzmann, L. Petersson, S. Gould, A. Habibian, <i>Learning Variations in Human Motions via Mix-and-Match Perturbation</i> (Submitted to)
BMVC 2019	M. Shoeiby, S. Aliakbarian, S. Anwar, L. Petersson, <i>Multi-Spectral Mosaic Super-Resolution Via Attention on Aggregated Features</i> (Submitted to)
ACCV 2018	S. Aliakbarian, F. Sadat Saleh, M. Salzmann, B. Fernando, L. Petersson, L. Andersson, <i>VIENA² : A Driving Anticipation Dataset</i>
ECCV 2018	F. Saleh, S. Aliakbarian, M. Salzmann, L. Petersson, J. Alvarez, <i>Effective Use of Synthetic Data for Urban Scene Semantic Segmentation</i>
TPAMI 2018	F. Saleh, S. Aliakbarian, M. Salzmann, L. Petersson, J. Alvarez, S. Gould, <i>Incorporating Network Built-in Priors in Weakly-supervised Semantic Segmentation</i>
ICCV 2017	S. Aliakbarian, F. Sadat Saleh, M. Salzmann, B. Fernando, L. Petersson, L. Andersson, <i>Encouraging LSTMs to Anticipate Actions Very Early</i>
ICCV 2017	F. Saleh, S. Aliakbarian, M. Salzmann, L. Petersson, J. Alvarez, <i>Bringing Background into the Foreground : Making All Classes Equal in Weakly-supervised Video Semantic Segmentation</i>
ECCV 2016	F. Saleh, S. Aliakbarian, M. Salzmann, L. Petersson, J. Alvarez, S. Gould, <i>Built-in Foreground/Background Prior for Weakly-Supervised Semantic Segmentation</i>

SKILLS

Programming	Proficient in Python, worked with C# and C++, also familiar with Matlab and Lua
Frameworks/Libraries	PyTorch, tf.Keras, OpenCV, Unity3D, Flask, also familiar with Tensorflow and other Python-based data analysis frameworks, e.g., Pandas

GRANTS, HONORS AND AWARDS

Qualcomm Inc.	Recipient of €18K grant for R&D from Qualcomm AI Research, 2018
ANU/CSIRO	Recipient of full scholarship award from ANU of \$94K, Australia, 2016
ANU	Recipient of travel grant award from ANU of \$7K, Australia, 2016
CSIRO	Recipient of CSIRO Top-up Award of \$35K, Australia, 2016
NICTA	Recipient of NICTA Project grant of \$10K, Australia, 2016

ACADEMIC ACTIVITIES

Reviewer	IEEE TPAMI, CVPR18, CVPR19, ECCV18, ICCV19, ECCV16, ECCV18, ICIP17, ICIP18, ICPR18
Lab Instructor	Python Programming for Scientists, Australian National University, 2017
Workshop	Deep Learning with Python and Keras, Data61, CSIRO, 2017
Teacher Assistant	Introduction to Programming, Algorithms and Data Structures, Concepts of Software Engineering, Isfahan University of Technology, 2012-2013

(RECENT) PROJECTS

Mitigating Posterior Collapse in Conditional Generative Models 2019

The problem of ignoring the random vector in the conditional generative models is related to *posterior collapse*; the posterior distribution collapses to the prior one, resulting in a latent variable carrying no information about the input. In this project, we proposed two novel techniques to mitigate this problem, thus, generating high quality, diverse, and plausible samples with a conditional VAE.

Human Motion Prediction 2018 - 2019

Human motion prediction is the task of generating a plausible continuation of an observed human motion, such that, the whole sequence remains natural. In this context, we proposed an action-agnostic recurrent encoder-decoder architecture that achieved state-of-the-art performance, generating future motions that are free of motion discontinuities and are within the context of the observation.

Deep Learning for Predicting Grain Fingerprints from Hyperspectral Data 2018

As a part of a research team, my task was designing a segmentation and recognition model for the type of wheat grains given hyperspectral representations. During wet seasons, rain at, or immediately before, harvest leads to sprouting of wheat grains on the plant which results in a significant deterioration in quality and consequently a downgrading in price (AU\$20 to \$50 per tonne). My approach achieved 96% accuracy in classifying whether a grain is sprouted, outperforming previously used technology by a large margin.

General Action Anticipation in Driving Scenarios 2016 - 2017

Action anticipation is critical in scenarios where one needs to react before the action is finalized. This is, for instance, the case in automated driving, where a car needs to, e.g., avoid hitting pedestrians and respect traffic lights. In this project, we introduced two anticipation frameworks, outperforming prior works, and a new, large-scale dataset, called VIENA², covering 5 generic driving scenarios.

Weakly supervised semantic scene segmentation 2015 - 2018

Semantic segmentation is the task of assigning a class label to every pixel in an image. Pixel-level annotations are expensive and time consuming to obtain. In this project, we proposed various methods to effectively perform semantic segmentation with the weakest level of supervision, i.e., image-level tags. On numerous scenarios and datasets, our approach shown to be highly effective in bridging the gap between weakly-supervised and fully-supervised approaches.

REFERENCES

Dr. Lars Petersson
Principal Research Scientist

Data61 | CSIRO, Australia

@ lars.petersson@data61.csiro.au

Dr. Mathieu Salzmann
Senior Research Scientist

CVLab | EPFL, Switzerland

@ mathieu.salzmann@epfl.ch

Prof. Stephen Gould
Associate Professor

ANU and ACRV, Australia

@ stephen.gould@anu.edu.au