Amlan Kar

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Education

Sep '17 - present **University of Toronto**, *PhD in Computer Science*, 3.9/4.0.
Advised by Prof. Sanja Fidler

May '17 **IIT Kanpur**, *B.Tech in Computer Science*, 9.6/10.0.

Experience

Sep '17 - present **University of Toronto**, *Graduate Researcher*, Prof. Sanja Fidler.
Working on Machine Learning for Machine Learning data, including human-in-the-loop data annotation [2,3,4,13], learning from noisy data [6] and efficient data acquisition [7] amongst others. I also co-lead the development of the *Toronto Annotation Suite*, a next-generation AI powered data annotation platform.

Nov '19 - present **NVIDIA**, *Research Scientist*.
Currently working on multiple projects related to generative models of simulated data

Jul '18 - Nov '19 **NVIDIA**, *Research Intern*, Prof. Sanja Fidler.
Research primarily related to learning generative models of data given parametric simulators. Has resulted in multiple publications including Meta-Sim and Meta-Sim2 [9, 14], Federated Medical Image Simulation [12], Neural Turtle Graphics [8], STEAL [6] amongst others

May '17 - Aug '17 **Fyusion Inc.**, *Research Intern*, Dr. Stefan Holzer.
Confidential

Aug '16 - May'17 **IIT Kanpur**, *Undergraduate Researcher*, Prof. Gaurav Sharma, Dr. Karan Sikka.
Worked on Video Action Recognition, resulting in a publication at CVPR 2017 [1]

May '16 - Jul '16 **University of Toronto**, *Research Intern*, Prof. Sanja Fidler, Prof. Raquel Urtasun.
Worked on extending Order Embeddings to generate Visual-Semantic Embeddings that simultaneously satisfy multiple ordering rules between entities

Publications

[14] Meta-Sim2: Unsupervised Learning of Scene Structure for Synthetic Data Generation
Jeevan Devaranjan*, Amlan Kar*, Sanja Fidler
ECCV 2020, Virtual

[13] Interactive Annotation of 3D Object Geometry using 2D Scribbles
Tianchang Shen*, Jun Gao*, Amlan Kar, Sanja Fidler
ECCV 2020, Virtual

[12] Federated Simulation for Medical Imaging
Daiqing Li, Amlan Kar, Nishant Ravikumar, Alejandro Frangi, Sanja Fidler
MICCAI 2020, Virtual **(Young Scientist Award Nominee)**

[11] Learning to Evaluate Perception Models using Planner-Centric Metrics
Jonah Philion, Amlan Kar, Sanja Fidler
CVPR 2020, Virtual

[10] Nonlinear Color Triads for Approximation, Learning and Direct Manipulation of Color Distributions
Masha Shugrina, Amlan Kar, Karan Singh, Sanja Fidler
SIGGRAPH 2020, Virtual

[9] Meta-Sim: Learning to Generate Synthetic Datasets
Amlan Kar, Aayush Prakash, Ming-Yu Liu, Eric Cameracci, Justin Yuan, Matt Rusiniak, David Acuna, Antonio Torralba, Sanja Fidler
ICCV 2019, Seoul, South Korea **(Oral Presentation)**

[8] Neural Turtle Graphics for Modeling City Road Layouts
Hang Chu, Daiqing Li, David Acuna, Amlan Kar, Maria Shugrina, Xinkai Wei, Ming-Yu Liu, Antonio Torralba, Sanja Fidler
ICCV 2019, Seoul, South Korea **(Oral Presentation)**

[7] Learning to Caption Images through a Lifetime by Asking Questions
Kevin Shen, Amlan Kar, Sanja Fidler
NeurIPS 2018, ViGIL Workshop **(Oral Presentation)**
ICCV 2019, Seoul, South Korea

[6] Devil is in the Edges: Learning Semantic Boundaries from Noisy Annotations
David Acuna, Amlan Kar, Sanja Fidler
CVPR 2019, Long Beach, CA, USA **(Oral Presentation)**

[5] Creative Flow+ Dataset
Maria Shugrina, Ziheng Liang, Amlan Kar, Jiaman Li, Angad Singh, Karan Singh, Sanja Fidler
CVPR 2019, Long Beach, CA, USA

[4] Fast Interactive Object Annotation with Curve-GCN
Huan Ling*, Jun Gao*, Amlan Kar, Wenzheng Chen, Sanja Fidler
CVPR 2019, Long Beach, CA, USA

[3] Object Instance Annotation with Deep Extreme Level Set Evolution
Zian Wang, David Acuna*, Huan Ling*, Amlan Kar, Sanja Fidler
CVPR 2019, Long Beach, CA, USA

[2] Efficient Interactive Annotation of Segmentation Datasets with PolygonRNN++
David Acuna*, Huan Ling*, Amlan Kar*, Sanja Fidler
CVPR 2018, Salt Lake City, Utah, USA

[1] AdaScan: Adaptive Scan Pooling in Deep Convolutional Neural Networks for Human Action Recognition in Videos
Amlan Kar*, Nishant Rai*, Karan Sikka, Gaurav Sharma
CVPR 2017, Honolulu, Hawaii, USA

Patents

[4] Iterative Spatial Graph Generation,
Hang Chu, Daiqing Li, David Jesus Acuna Marrero, Amlan Kar, Maria Shugrina, Ming-Yu Liu, Antonio Torralba Barriuso, Sanja Fidler
US20200302250A1 Pending Approval

[3] Learning to generate synthetic datasets for traning neural networks
Amlan Kar, Aayush Prakash, Ming-Yu Liu, David Jesus Acuna Marrero, Antonio Torralba Barriuso, Sanja Fidler
US20200160178A1 Pending Approval

[2] Method and system for color representation generation
Masha Shugrina, Amlan Kar, Sanja Fidler, Karan Singh
US20190355155A1 Pending Approval

[1] Systems and methods for polygon object annotation and a method of training and object annotation system
Sanja Fidler, Amlan Kar, Huan Ling, Jun Gao, David Acuna
US10643130B2

Teaching Experience

Jan '18 - May '18 **Introduction to Visual Understanding**, *CSC420, UofT*, TA.
Preparation of course material and assignments

Sep '17 **Introduction to AI**, *CSC384, UofT*, TA.
- Dec '17 Preparation of course material and assignments

Jan '17 **Topics in Computer Vision**, *CS698U, IITK*.
- May '17 Preparation of course material and assignments

Aug '16 **Introduction to Computing**, *ESC101A, IITK*, Tutor.
- May '17 Teaching tutorials, setting and grading question papers and supervising lab sessions

Aug '14 **Introduction to Electrodynamics**, *PHY103A, IITK*, Academic Mentor.
- Apr '15 Led doubt clearing sessions and personally mentored students

Academic Achievements

Jun '18 **PhD Conference Travel Award, UofT**, *CVPR 2018*.

Apr '15,'16 **Academic Excellence Award, IIT Kanpur**, *Dean's List*.

Nov '14 **Best Sectional Award**, *Course Project for TA - 201*.
Received the award for building a Mechanical Object Elevator

Jun '13 **IIT-JEE**, *All India Rank - 271 (99.998 Percentile)*.

Apr '13 **Indian National Physics Olympiad**, *Selected in Top 35 in India*.
Awarded gold medal and attended selection camp for Indian team to IPhO '13

Dec '12 **National Standard Olympiads**, *Selected in Top 300(1%) in India*.
Selected in Top 1% in National Standard Olympiads in Physics, Chemistry and Astronomy

Aug '12 **Kishore Vaigyanik Protsahan Yojana(KVPY)**.
One of 300 recipients of KVPY - 2012 scholarship for higher studies in Basic Sciences

Aug '12,'07 **All Rounder of the Year Award, D.A.V. CSPur**.

Aug '08 **National Talent Search Examination**.
One of 800 recipients of NTSE - 2008 scholarship

Aug '06 **National Cyber Olympiad**, *All India Rank - 1*.

Academic Service

Reviewer CVPR '18, '19, '20, '21; ICLR '19 '20; ECCV '18, '20; ICCV '19