Dina Bashkirova

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Research Interests

Computer Vision, Domain Adaptation, Generative Models

Education

2018-present **PhD Student** in Computer Science
Boston University
Research Advisor: Kate Saenko
GPA: 3.86 / 4

2016-2018 Research Assistant
Kazan Federal University
Project #1: Automatic Blood Vessel Segmentation with Deep Learning
Project #2: Multidimensional Fast L^1 Gaussian Convolution Using Domain Splitting
Research Advisor: Roustam Latypov and Shin Yoshizawa

2014 - 2016 **M.Sc.** in Computer Science
Kazan Federal University
Thesis: Passive Steganalysis of JPEG Images with Machine Learning
Research Advisor: Evgeny Razinkov
GPA: 4.9 / 5

2010 - 2014 **B.Sc.** in Computer Science with Honors
Kazan Federal University
Thesis: Analysis of Heuristics for Multi-Agent Assignment Problem
Research Advisor: Anastasia Andrianova
GPA: 4.98 / 5

Fellowships and Awards

2018 Dean's Fellowship at Boston University
2011-2014 BSc Scholarship for High Academic Results from State Department of Education
2014 Award for Outstanding Academic Achievement at KFU

Work Experience

Summer 2022 Intern Google Research (AI4Design Team)
Summer 2021 Intern at Google Research (Cerebra Team)
Summer 2020 Intern at Google Research (Cerebra Team)
2018-present Graduate Student at Boston University Image and Video Computing Group
Fall 2018 Grader for CS 480/680 (Introduction to Computer Graphics) at BU
2017-2018 Visiting Scholar at Boston University Image and Video Computing Group
2016-2017 Visiting Research Assistant at RIKEN Image Processing Research Team
2015-2016 Research Assistant and Developer at Eidos Group LLC, Kazan
2013-2014 C# Developer at Bars Group CJSC, Kazan

Publications

2023 **MaskSketch: Unpaired Structure-guided Masked Image Generation** *CVPR'23*, Dina Bashkirova, Jose Lezama, Kihyuk Sohn, Kate Saenko, Irfan Essa.

2022 **VisDA-2022 Competition: Sim2Real Domain Adaptation for Industrial Waste Sorting**, *NeurIPS'22 Competition*, Dina Bashkirova, Samarth Mishra, Diala Lteif, Piotr Teterwak, Donghyun Kim, Berk Calli, Sarah Adel Bargal, Vitaly Ablavsky, Kate Saenko.

2022 **ZeroWaste Dataset: Towards Deformable Object Segmentation in Cluttered Scenes**, *CVPR'22*, Dina Bashkirova, Mohamed Abdelfattah, Ziliang Zhu, James Akl, Fadi Alladkani, Ping Hu, Vitali Ablavsky, Berk Calli, Sarah Adel Bargal, Kate Saenko.

2022 **Disentangled Unsupervised Image Translation via Restricted Information Flow**, *WACV'23*, Ben Usman, Dina Bashkirova, Kate Saenko.

2021 **VisDA-2021 Competition: Universal Domain Adaptation to Improve Performance on Out-of-Distribution Data**, *NeurIPS'21 Competition*, Dina Bashkirova, Dan Hendrycks, Donghyun Kim, Samarth Mishra, Kate Saenko, Kuniaki Saito, Piotr Teterwak, Ben Usman.

2021 **Evaluation of Correctness in Unsupervised Many-to-Many Image Translation**, *WACV'22*, Dina Bashkirova, Ben Usman, Kate Saenko.

2020 **Compositional Models: Multi-Task Learning and Knowledge Transfer with Modular Networks**, *on arxiv*, Andrey Zhmoginov, Dina Bashkirova, Mark Sandler.

2019 **Adversarial Self-Defense for Cycle-Consistent GANs**, *NeurIPS'19*, Dina Bashkirova, Ben Usman, Kate Saenko.

2018 **Unsupervised Video-to-Video Translation**, *(on arXiv)*, Dina Bashkirova, Ben Usman, Kate Saenko.

2017 **Fast L1 Gauss Transforms for Edge-Aware Image Filtering**, *Proceedings of ISP RAS,* Dina Bashkirova, Shin Yoshizawa, Roustam Latypov, Hideo Yokota.

2016 **Convolutional Neural Networks for Image Steganalysis**, *BioNanoScience (Springer)* Dina Bashkirova.

Posters and Presentations

2023 WACV, Waikoloa Hawaii – *poster*

2022 NeurIPS, CVPR New Orleans – *posters*

2022 WACV, Waikoloa Hawaii – *poster*

2019 IVC AIR Seminar at Boston University, – *oral presentation*

2019 NeurIPS, – *poster*

2017 8th Biomedical Interface Workshop in Miyakojima, Japan – *poster*

2017 International Computer Vision Summer School in Sicily, Italy – *poster*

2017 Spring/Summer Young Researchers Colloquium on Software Engineering, Innopolis, Russia – *oral presentation*

Professional Activities

2022 CVPR, ICCV, ICML, IRLC, reviewer. Co-organized VisDA 2022 Challenge at NeurIPS.

2021 ICCV, NeurIPS, ICLR, reviewer. Helped organizing the NeurIPS VisDA 2021 Workshop.

2021 Organized the Vision Transformers reading group at AIR IVC group.

2018-2020 Social Chair at AIR IVC group.

2020 CVPR, WACV, NeurIPS, ICLR, reviewer.

2019 Winter Conference on Applications of Computer Vision (WACV '20), reviewer.

2018 CVPR Workshop on Computer Vision for Microscopy Image Analysis, reviewer.

2017 International Computer Vision Summer School (ICVSS 2017), Sicily, Italy.

2015 Microsoft Research School on Machine Learning, Saint Petersburg, Russia

Research Projects

2022 **Structure-guided image generation with masked generative transformers.**
(Google Research AI4Design Team)
In this research project, we aim to leverage the learned domain prior of the masked generative transformer for sketch-to-photo translation.

2022 **VisDA 2022 Challenge: Domain adaptation for Industrual Waste Sorting**
Collected the data and organized the challenge to promote the real-life application of AI for waste sorting in the computer vision community.

Summer 2021 **Cross-domain Weakly-supervised Object Localization via Image-to-Image Translation**
(Google Cerebra team)
Developed a weakly-supervised localization pipeline for object localization under domain shift between object classes using unsupervised image-to-image translation.

2020-present **Unsupervised Cross-Domain Disentanglement for Many-to-Many Image Translation**
(Boston University Computer Vision and Learning Group)
Exploring unsupervised disentanglement of shared and domain-specific factors of variation (aka content-style disentanglement) for many-to-many image translation. Developed a set of metrics that measure the cross-domain disentanglement quality.

Summer 2020 **Compositional Models for Domain Adaptation**
(Google Cerebra team)
Implemented the compositional model for multitask learning and extended it for the domain adaptation application.

2019-present **Automated Robotic Recycling Project**
(Boston University Computer Vision and Learning Group)
Developing the computer vision module for weakly supervised semantic segmentation and tracking of recyclable objects on the conveyor belt.

2018-2019 **Adversarial Self-Defense for Cycle-Consistent GANs**
(Boston University Computer Vision and Learning Group)
Analyzed of the problem of self-adversarial information hiding of Cycle-Consistent GANs and developed two defense techniques that prevent information hiding and thus increase the translation reliability.

2017-2018 **Unsupervised Video-to-Video Translation using Cycle-Consistent Adversarial Networks**
(Boston University Computer Vision and Learning Group)
Proposed a new task of unsupervised video-to-video translation and compared a sequence-based solution with frame-based translation approaches.

2016-2017 **Fast L^1 Gauss Transforms**
(RIKEN Image Processing Research Team)
Proposed an efficient approximation for multidimensional Gauss transform using properties of L^1 distance and domain splitting.

2016 **Passive Steganalysis of JPEG Images using Machine Learning**
(MSc Thesis Project at Kazan Federal University)
Developed a system for detection of hidden embedded messages using various Machine Learning methods

2015-2016 **3D Reconstruction of Vessels from CT Images**
(Eidos Group)
Performed preliminary research on vascular system reconstruction from CTA images and worked on improving performance of 3D modeling system.

2015-2016 **Sequential Threshold Method for Machine Learning**
(Igor Konnov Group at Kazan Federal University)
Applied sequential splitting method for solving optimization problems that arise in Machine Learning.

2014 **Analysis of Heuristics for Multi-Agent Assignment Problem**
(BSc Thesis Project at Kazan Federal University)
Investigated efficiency of various heuristic algorithms for Multidimensional Knapsack Problem (Assignment Problem).

Selected Coursework

2018 CS 542 Machine Learning, Boston University.
2018 CS 585 Image and Video Computing, Boston University.
2020 CS 537 Randomness in Computing, Boston university.