Dina Bashkirova

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Research Interests

Machine Learning, 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

2011-2014 BSc Scholarship for High Academic Results from State Department of Education
2014 Award for Outstanding Academic Achievement at KFU

Publications

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

2021 **ZeroWaste Dataset: Towards Automated Waste Recycling**, *in submission*, Dina Bashkirova, Mohamed Abdelfattah, Ziliang Zhu, James Akl, Fadi Alladkani, Ping Hu, Vitali Ablavsky, Berk Calli, Sarah Adel Bargal, 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.

Research Projects

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).

Posters and Presentations

2019 IVC AIR Seminar at Boston University, – *oral presentation*
2019 Thirty-third Conference on Neural Information Processing Systems, – *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*

Work Experience

Summer 2020 Software Engineering Intern at Google
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

Professional Activities

2021 ICCV, NeurIPS, ICLR, reviewer
2020 CVPR'20, WACV'21, NeurIPS'20, ICLR'21, 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

Core Skills

Tools/Languages: C#, C++, Python, Keras, Tensorflow, Pytorch, LaTeX
Online Courses: CS231n: Convolutional Neural Networks for Visual Recognition *(Stanford)*, Introduction to Probability *(edX)*.

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.