Ivan Sosnovik

PhD student, University of Amsterdam
Applied Research Intern, Amazon MLSL

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Research Interests

Computer Vision, Machine Learning, Invariance and Equivariance in Neural Networks, Representation Learning, Structured Neural Networks

Education

2017 – Present
PhD, Computer Vision,
University of Amsterdam, Amsterdam, The Netherlands
"Learning Symmetries in Computer Vision"

2015 – 2017
MSc with Honors, Applied Mathematics and Physics,
Moscow Institute of Physics and Technology, Moscow, Russia
Skolkovo Institute of Science and Technology, Moscow, Russia
"Neural Networks for Topology Optimization"

2011 – 2015
BSc with Honors, Applied Mathematics and Physics,
Moscow Institute of Physics and Technology, Moscow, Russia
"Two-dimensional system for the prior positioning of the STM"

Highlights

Scholarships
"Foundation for the Development of Innovation Education" (2012 – 2014)

Awards
Kaggle *"Leaf Classification"* competition [interview]
National Physics Olympiad for Students 2013
Moscow Physics Olympiad 2011
Phystech Mathematical Olympiad 2011
Phystech Physics Olympiad 2011
Moscow Mathematical Olympiad 2010
Moscow Physics Olympiad 2010

Academic Experience

Teaching
MSc course **Applied Machine Learning**,
University of Amsterdam, 2017 – 2020

MSc, PhD course **iOS Game Development**,
Skolkovo Institute of Science and Technology, 2016

Reviewing
ICML INNF+ 2021, ICCV 2021, ICLR 2021, WACV 2021, CVPR 2018, Engineering Optimization, Computer Methods in Applied Mechanics and Engineering, The Visual Computer

Academic Experience (continued)

Supervision	Cees Kaandorp, Lucas Meijer, Dario E. Shehni Abbaszadeh, Dave Meijdam, Jonne Goedhart, Daan Ferdinandusse, Gongze Cao, Michał Szmaja, Jan Jetze Beitler

Work Experience

06.2021 – Present **Applied Research Intern, Amazon Machine Learning Solutions Lab**

08.2016 – 09.2016 **Intern, SAP Labs**
Developed prototypes for a smart fleet management system. Used SAP HCP for the data aggregation and analysis. Designed software and hardware solutions for tracking the engine's and the vehicle's parameters.

02.2016 – 08.2016 **iOS Developer, Teachbase**
Developed the client-server iOS application for watching educational courses. Developed the platform for testing. [**link**]

09.2014 – 06.2015 **Laboratory Assistant, P.L. Kapitza Institute for Physical Problems**
Studied nano-structured materials. Designed a system for the prior positioning of the needle of the scanning tunneling microscope. Developed software for data analysis and control.

Skills

Coding	Python, Objective-C, Swift, C
Technical	Cryogenics, Vacuum Equipment, Scanning Tunneling Microscopy

Publications

2021 A. Moskalev, I. Sosnovik, A. Smeulders, *"Two is a Crowd: Tracking Relations in Videos"*, Preprint, 2021, [pdf]

I. Sosnovik, A. Moskalev, A. Smeulders, *"How to Transform Kernels for Scale-Convolutions"*, ICCV VIPriors Workshop, 2021, [link]

A. Moskalev, I. Sosnovik, A. Smeulders, *"Relational Prior for Multi-Object Tracking"*, ICCV VIPriors Workshop (**Oral**), 2021, [link]

S. Gulshad*, I. Sosnovik*, A. Smeulders, *"Built-in Elastic Transformations for Improved Robustness"*, Preprint, 2021, [pdf]

I. Sosnovik, A. Moskalev, A. Smeulders, *"DISCO: accurate Discrete Scale Convolutions"*, Preprint, 2021, [pdf][code]

2020 I. Sosnovik*, A. Moskalev*, A. Smeulders, *"Scale Equivariance Improves Siamese Tracking"*, WACV, 2021, [pdf][code]

Publications (continued)

2019 I. Sosnovik, M. Szmaja, A. Smeulders, *"Scale-Equivariant Steerable Networks"*, ICLR, 2020, [pdf][code]

A. Atanov, A. Volokhova, A. Ashukha, I. Sosnovik, D. Vetrov, *"Semi-Conditional Normalizing Flows for Semi-Supervised Learning"*, ICML INNF, 2019, [pdf][code]

I. Sosnovik, I. Oseledets, *"Neural Networks for Topology Optimization"*, Russian Journal of Numerical Analysis and Mathematical Modelling, 34(4) [pdf][code]

2018 J.J. Beitler, I. Sosnovik, A. Smeulders, *"PIE: Pseudo-Invertible Encoder"*, [pdf]