

# Ivan Sosnovik

PhD student, University of Amsterdam  
Applied Research Intern, Amazon ML SL

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## Research Interests

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

## Education

2017 – Present	<b>PhD, Computer Vision</b> , University of Amsterdam, Amsterdam, The Netherlands <i>“Learning Symmetries in Computer Vision”</i>
2015 – 2017	<b>MSc with Honors, Applied Mathematics and Physics</b> , Moscow Institute of Physics and Technology, Moscow, Russia Skolkovo Institute of Science and Technology, Moscow, Russia <i>“Neural Networks for Topology Optimization”</i>
2011 – 2015	<b>BSc with Honors, Applied Mathematics and Physics</b> , Moscow Institute of Physics and Technology, Moscow, Russia <i>“Two-dimensional system for the prior positioning of the STM”</i>

## Highlights

Scholarships	<i>“Foundation for the Development of Innovation Education”</i> (2012 – 2014)
Awards	Kaggle <i>“Leaf Classification”</i> 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 <b>Applied Machine Learning</b> , University of Amsterdam, 2017 – 2020  MSc, PhD course <b>iOS Game Development</b> , 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

## 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              **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, 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)

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- 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*”, [\[pdf\]](#)