

# Ivan Sosnovik

PhD student, University of Amsterdam

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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 <a href="#">[interview]</a> 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, Computer Vision and Image Understanding, Engineering Optimization, Computer Methods in Applied Mechanics and Engineering, The Visual Computer
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 – 10.2021      **Amazon ML**SL, Applied Research Intern  
Worked on representation learning for 3D garment reconstruction.
- 08.2016 – 09.2016      **SAP Labs**, Intern  
Developed prototypes for a smart fleet management system. Designed software and hardware solutions for tracking the engine's and the vehicle's parameters.
- 02.2016 – 08.2016      **Teachbase**, iOS Developer  
Developed a client-server iOS application for watching educational courses. [\[link\]](#)
- 09.2014 – 06.2015      **P.L. Kapitza Institute for Physical Problems**, Laboratory Assistant  
Studied nano-structured materials. Designed a system for the prior positioning of the needle of the scanning tunneling microscope.

## Skills

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

## Publications

- 2021      I. Sosnovik, A. Moskalev, A. Smeulders, “*DISCO: accurate Discrete Scale Convolutions*”, BMVC (**Oral**), 2021 [\[pdf\]](#)[\[code\]](#)
- 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, [\[pdf\]](#)
- 2020      I. Sosnovik\*, A. Moskalev\*, A. Smeulders, “*Scale Equivariance Improves Siamese Tracking*”, WACV, 2021, [\[pdf\]](#)[\[code\]](#)
- 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, [\[pdf\]](#)[\[code\]](#)

## Publications (continued)

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- 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](#)]