

# Artem MOLCHANOV

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## RESEARCH INTERESTS

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Robotics, Artificial General Intelligence, Reinforcement Learning, Deep Learning.

## EDUCATION

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- AUG 2013 - MAY 2020 **PhD in Computer Science / Robotics,**  
**University of Southern California**, Los Angeles, US  
Thesis: Data Scarcity in Robotics: Leveraging Structural Priors and Representation Learning  
Advisor: Gaurav S. Sukhatme  
GPA: 3.88/4.0
- SEP 2004 - MAY 2010 **Engineering Degree in Robotics,**  
**Bauman Moscow State Technical University (BMSTU)**, Moscow, Russia  
Thesis: Attitude and Heading Reference System for a  
Remotely Operated Underwater Vehicle  
Advisor: Sergey A. Egorov  
GPA: 4.94/5.0. **Diploma with Honours**

## PROFESSIONAL EXPERIENCE

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- JUN-SEPT 2019 | **Research Intern at Facebook AI Research**, Menlo Park, CA, US  
Project on Meta Learning via Learned Loss.
- JUN-AUG 2017 | **Research Intern at Nvidia**, Seattle area, WA, US  
*Contributed into 2 research projects:*  
- Project on Automatic Curriculum Generation for Deep Reinforcement Learning with Sparse rewards.  
- Project on Image-Centric Domain Randomization for Learning Human-Readable Plans from Real-World demonstrations.
- JUN-AUG 2016 | **Deep Learning Intern at Volkswagen group of America**, Belmont, US  
Research and bench-marking of deep compression algorithms using TensorFlow in application to autonomous driving.
- JUN-AUG 2015 | **Software Intern at Blue River Technology**, Sunnyvale, US  
Development of a plant classifier/detector for the vision system of the Lettuce Thinning Bot using convolutional neural networks.
- MAR 2009  
JUL 2013 | **Control Systems Engineer at**  
**Research Institute of Special Mechanical Engineering of BMSTU**, Moscow, Russia  
*Development of Underwater Robotic Systems:*  
- Implementation of motion control and signal processing algorithms in C++ and Matlab.  
- Design of software and hardware architectures of control systems.  
- Design and implementation of user interfaces for pilot control units in Qt (C++).  
- Deployment and field tests (ocean trials) of the system.

## SOFTWARE DEVELOPMENT SKILLS

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Programming Languages: PYTHON, C/C++, MATLAB,  $\LaTeX$   
Libraries and Frameworks: PYTORCH, TENSORFLOW, KERAS, Caffe, ROS, QT, OPENCV  
SW Development Tools: GIT, PYCHARM, CMAKE, QTCREATOR, KDEVELOP  
Operating Systems: LINUX

## GRANTS, SCHOLARSHIPS, AWARDS

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MAY 2019, MAY 2017 USC Robotics Bekey Award for RESL compute infrastructure development  
NOV 2016, MAY 2017 NVIDIA GPU grant  
2005-2010 Recipient of stipend for outstanding students at BMSTU

## TEACHING

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SUMMER 2020 Machine Learning (CS-567). Teaching Assistant.  
FALL 2017 Deep Learning (CS-599). Teaching Assistant.  
SUMMER 2018 Introduction to Programming (CS-103). Teaching Assistant.  
2017 – 2019 Introduction to Computer Science (CS-109). Teaching Assistant.

## LATEST PUBLICATIONS

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S. Bechtle\*, A. Molchanov\*, Y. Chebotar\*, E. Grefenstette, L. Righetti, G.S. Sukhatme, F. Meier. [Meta-Learning via Learned Loss](#). International Conference on Pattern Recognition (ICPR), Jan 2021

A. Molchanov, T. Chen, W. Hönig, J. A. Preiss, N. Ayanian, G. S. Sukhatme. [Sim-to-\(Multi\)-Real: Transfer of Low-Level Robust Control Policies to Multiple Quadrotors](#). IEEE/RSJ International Conference on Intelligent Robots and Systems, Nov 2019

J. Tremblay, T. To, A. Molchanov, S. Tyree, J. Kautz, S. Birchfield. [Synthetically Trained Neural Networks for Learning Human-Readable Plans from Real-World Demonstrations](#). IEEE International Conference on Robotics and Automation (ICRA), May 2018

A. Molchanov, O. Kroemer, Z. Su, G. Sukhatme. [Contact Localization on Grasped Objects using Tactile Sensing](#). IEEE International Conference on Intelligent Robots and Systems (IROS), 2016.

Y. Chebotar, K. Hausman, Z. Su, A. Molchanov, O. Kroemer, G. Sukhatme, S. Schaal. BiGS: BioTac Grasp Stability Dataset. ICRA Workshop on Grasping and Manipulation Datasets, 2016

Z. Su, K. Hausman, Y. Chebotar, A. Molchanov, G. Loeb, G. Sukhatme, S. Schaal. Force Estimation and Slip Detection for Grip Control using a Biomimetic Tactile Sensor. IEEE-RAS International Conference on Humanoid Robotics (Humanoids), Jul 2015.

A. Molchanov, A. Breitenmoser, G. Sukhatme. Active Drifters: Towards a Practical Multi-Robot System for Ocean Monitoring. IEEE International Conference on Robotics and Automation (ICRA), May 2015.

A. Molchanov, A. Breitenmoser, G. Sukhatme. Active Drifters: Sailing with the Ocean Currents. RSS Workshop on Autonomous Control, Adaptation, and Learning for Underwater Vehicles, 2014.

A. Molchanov, K. Chernenko, S. Egorov, A. Kutsenko. Data processing and Control System of a Small Survey Class Remotely Operated Underwater Vehicle. IV All-Russian Tech Conference «Technical problems of exploitation of the World Ocean», pages 66-70, Vladivostok, Russian Federation, 2011.

## PRESS

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Our work on RL for quadrotors was featured in [USC Viterbi news article](#).

## PROFESSIONAL ACTIVITIES

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### **Student advisor:**

Tao Chen - Sim-to-Real for Quadrotor Control. Earned 2019 Viterbi Master's Award.

Jialou Wang - Sim-to-Real for Quadrotor Control.

Pushpreet Singh - Sim-to-Real for Quadrotor Control.

Joe Mathai - RL for Active Perception

**Reviewer:** ICRA 2014-2019, IROS 2014-2020, CoRL 2018, Journal of Ocean Engineering and Science (JOES) 2016, Autonomous Robots (AURO) 2019, IEEE Transactions on Robotics (T-RO) 2019

## ENTREPRENEURIAL ACTIVITIES

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**Swerve.ai:** Co-founder and (former) Chief Data Officer. The startup targeted autonomous driving safety improvement by developing technologies for car planning and control at the limits of handling.

## INTERESTS AND HOBBIES

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Robotics and AI, Sports (Rock Climbing, Running, BJJ), Guitar playing, Motorcycles