

Dr. Alexander Sherikov

CONTACT INFORMATION

United Arab Emirates

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PERSONAL INFORMATION

Website <http://sherikov.net>

Latest CV <https://github.com/asherikov/cv>

Other <http://github.com/asherikov>
<https://www.linkedin.com/in/asherikov>

SUMMARY

- Fullstack autonomous systems software developer who worked on diverse problems including control, mapping, planning, sensor integration, simulation, reinforcement learning, deployment, telemetry collection, etc.
- R&D engineer with a doctoral degree in robot control, familiar with numerical environments and data handling frameworks, as well as development of numerical software.
- C++/python UNIX/Linux developer with 15 years international experience in general IT, networking, software quality and architecture, task management, etc.

EXPERIENCE

2022 – 2023 Reinforcement Learning Engineer, Keybotic, remote

- Reinforcement learning for quadruped robot control using parallel GPU-accelerated simulations. [python, ROS, IsaacGym]

2019 – 2022 Senior Autonomy Engineer, Sevendof, Norway

- Responsible for UAV onboard software and quality: architecture, 3d mapping, simulated and field tests, software quality, cross-compilation, deployment, sensor integration. [C++, ROS, CUDA/Thrust]

2017 – 2019 Software & Control Engineer, PAL Robotics, Spain

- Various tasks related to humanoid robot simulation, identification, motion planning, control (inverse kinematics and dynamics). Development of in-house rigid body simulator. [C++, ROS]
- Supported by “Torres Quevedo Program (PTQ)” grant
https://www.ciencia.gob.es/stfls/eSede/Ficheros/2018/RESOLUCION_TORRES_QUEVEDO-2017-1.pdf

2016 – 2017 Research Engineer, INRIA, France

- Development of a software framework for implementation of optimization-based controllers for humanoid robots. [C++] <https://bip-team.github.io/humoto/>

2012 – 2016 Doctoral Student, INRIA, France

- Research in model predictive control of humanoid robots for balancing and locomotion. [C++, MATLAB]
- Participation in “Horizon H2020 COMANOID” (<https://cordis.europa.eu/project/id/645097>) research project focused on development of humanoid robots and their industrial applications.

2012 – 2012 Software Developer, Örebro University, Sweden

- Implementation of a path tracking model predictive controller with obstacle avoidance for an autonomous forklift truck. [C++, ROS, CAN]
- Participation in “SAUNA” research project focused on safe autonomous navigation for industrial vehicles like forklift or mining trucks. <https://www.oru.se/english/research/research-projects/rp/?rdb=p693>

2009 – 2010 System & Network Administrator, InfoLan LLC, Russia

- Administration of FreeBSD servers and configuration of networking hardware of an Internet service provider.

PERSONAL OPEN-SOURCE PROJECTS

- <https://github.com/asherikov/qpmad>: High-performance quadratic programming solver in C++
- <https://github.com/asherikov/ariles>: C++ reflection/serialization library
- <http://sherikov.net/Projects/naowalk.html>: walking controller for Nao humanoid robot
- <https://github.com/asherikov/ccws>: ROS development and continuous integration framework

EDUCATION

2012 – 2016 University of Grenoble, France

Degree PhD in Automatic Control and Production Systems

Thesis Balance preservation and task prioritization in whole body motion control of humanoid robots

<https://github.com/asherikov/phd-thesis/raw/master/asherikov-phd-thesis.pdf>

Summer schools Numerical Optimal Control, 04.08.2014 – 13.08.2014, Freiburg, Germany

2010 – 2012 Örebro University, Sweden

Degree Master in Robotics and Intelligent Systems

Thesis Model predictive control of a walking bipedal robot using online optimization

<https://github.com/asherikov/ms-thesis/raw/master/asherikov-ms-thesis.pdf>

2003 – 2008 Petrozavodsk State University, Russia

Degree Specialist in Information Systems and Technologies

Thesis Application of multidimensional data structures for indexing of NetFlow records

SKILLS

AUTONOMOUS SYSTEMS

<i>Manipulator modeling and control</i>	RBDL, URDF
<i>Simulators</i>	Microsoft AirSim, Gazebo, IsaacGym
<i>Visualization</i>	RViz, OpenSceneGraph
<i>Frameworks</i>	ROS, Nao SDK
<i>Motion planning</i>	OMPL
<i>Volumetric mapping</i>	OpenVDB, OctoMap
<i>UAV controllers</i>	PX4, DJI, ArduPilot
<i>Messaging</i>	protobuf, mavlink, UAVCAN, CAN, mqtt
<i>Sensors</i>	lidars, GPS (RTK, RINEX), ADS-B, IMU
<i>Telemetry</i>	time-series databases, Grafana, PlotJuggler
<i>Hardware platforms</i>	Raspberry Pi, NVIDIA Jetson Nano / Xavier
<i>Time synchronization</i>	NTP, PTP
<i>Geodetic libraries</i>	geopandas, pyproj, shapely, GeographicLib, OSMnx

RESEARCH AND DEVELOPMENT

<i>Numerical optimization</i>	quadratic programming (qpOASES, QuadProg++, ipopt, qpmd) sequential quadratic programming, prioritized least squares (LexLS), linear complementarity problems (siconos)
<i>Control</i>	model predictive control, inverse kinematics and dynamics
<i>Modeling</i>	rigid body modeling of robots, basics of friction and collision
<i>Numerical environments / CAS</i>	Octave/MATLAB, Maxima, ipython
<i>Numerical libraries</i>	Eigen, numpy, pandas, scipy
<i>Reinforcement learning</i>	PyTorch, optuna, tensorboard, ONNX
<i>Document preparation systems</i>	L ^A T _E X
<i>Visualization</i>	matplotlib, graphviz, asymptote

SOFTWARE DEVELOPMENT

<i>C/C++</i>	STL, Boost, C++XX, POSIX, pthreads
<i>Parallel computations</i>	CUDA/Thrust
<i>Compilers/compiler wrappers</i>	clang, gcc, nvcc, ccache, scan-build
<i>Version control systems</i>	git, SVN
<i>Debugging</i>	gdb, lldb, strace
<i>Static and dynamic checks</i>	gcc/clang sanitizers, cppcheck, valgrind, clang-tidy, pylint, flake8
<i>Profilers</i>	callgrind, gprof
<i>Testing</i>	googletest, googlemock, Boost UTF, ctest
<i>Build automation tools</i>	catkin, colcon, cmake, make, autotools
<i>Documentation</i>	doxygen
<i>Packaging</i>	FreeBSD ports, dpkg, CloudSmith, conan, vcpkg, guix
<i>Continuous integration</i>	GitLab, GitHub Actions, Jenkins, Travis
<i>Web-based SCM</i>	GitHub, GitLab, GForge, Gitea
<i>Task management</i>	Jira, Trello

UNIX SYSTEMS ADMINISTRATION AND NETWORKING

<i>Operating systems</i>	FreeBSD, Ubuntu
<i>Isolation/emulation</i>	docker, qemu, systemd-nspawn, VirtualBox
<i>Service management</i>	systemd, dinit
<i>Computer networks</i>	TCP/IP, VLAN, DHCP, DNS, SMTP, routing, switching
<i>Other</i>	sh, bash, CLI utilities (xargs, sed, grep, screen, ...)

LANGUAGES

Russian (native), English (fluent)

ACADEMIC ACTIVITIES

- Reviewer for IEEE T-RO, ICRA, IROS, Humanoids.
- Google Scholar page: <https://scholar.google.fr/citations?user=yV0vGdOAAAAJ&hl=en>.

PUBLICATIONS

- [1] D. J. Agravante, A. Cherubini, A. Sherikov, P.-B. Wieber, and A. Kheddar. “Human-Humanoid Collaborative Carrying”. In: *IEEE Transactions on Robotics* 35.4 (2019), pp. 833–846. DOI: [10.1109/TRO.2019.2914350](https://doi.org/10.1109/TRO.2019.2914350). URL: <https://hal-lirmm.ccsd.cnrs.fr/lirmm-01311154>.
- [2] D. J. Agravante, A. Sherikov, P.-B. Wieber, A. Cherubini, and A. Kheddar. “Walking pattern generators designed for physical collaboration”. In: *IEEE ICRA*. 2016.
- [3] N. Bohórquez, A. Sherikov, D. Dimitrov, and P.-B. Wieber. “Safe navigation strategies for a biped robot walking in a crowd”. In: *IEEE-RAS International Conference on Humanoid Robots*. 2016.
- [4] S. A. Homsy, A. Sherikov, D. Dimitrov, and P.-B. Wieber. “A hierarchical approach to minimum-time control of industrial robots”. In: *IEEE ICRA*. 2016.
- [5] D. Serra, C. Brasseur, A. Sherikov, D. Dimitrov, and P.-B. Wieber. “A Newton method with always feasible iterates for Nonlinear Model Predictive Control of walking in a multi-contact situation”. In: *IEEE-RAS International Conference on Humanoid Robots*. 2016.
- [6] H. Andreasson, A. Bouguerra, M. Cirillo, D. Dimitrov, D. Driankov, L. Karlsson, A. Lilienthal, F. Pecora, J. Saarinen, A. Sherikov, and T. Stoyanov. “Autonomous Transport Vehicles: Where We Are and What Is Missing”. In: *Robotics Automation Magazine, IEEE* 22.1 (2015).
- [7] C. Brasseur, A. Sherikov, C. Collette, D. Dimitrov, and P.-B. Wieber. “A robust linear MPC approach to online generation of 3D biped walking motion”. In: *IEEE-RAS International Conference on Humanoid Robots*. 2015.
- [8] D. Dimitrov, A. Sherikov, and P.-B. Wieber. “Efficient resolution of potentially conflicting linear constraints in robotics”. Preprint. 2015. URL: <https://hal.inria.fr/hal-01183003>.
- [9] A. Sherikov, D. Dimitrov, and P.-B. Wieber. “Balancing a humanoid robot with a prioritized contact force distribution”. In: *IEEE-RAS International Conference on Humanoid Robots*. 2015.
- [10] A. Sherikov, D. Dimitrov, and P.-B. Wieber. “Whole body motion controller with long-term balance constraints”. In: *IEEE-RAS International Conference on Humanoid Robots*. 2014.
- [11] D. Dimitrov, A. Sherikov, and P.-B. Wieber. “A sparse model predictive control formulation for walking motion generation”. In: *IEEE/RSJ IROS*. 2011.
- [12] A. Sherikov and Y. Bogoyavlenskii. “The use of multidimensional index structures for NetFlow record processing”. In: *AMICT '07, Proceedings of the Annual International Workshop on Advances in Methods of Information and Communication Technology*. 2007.