Alexander Sherikov

CONTACT INFORMATION

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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

Autonomous systems software engineer with a doctoral degree in robot control and diverse 10+ years experience in general IT, software quality and architecture, computational software, robotics frameworks, physical simulation, and machine learning.

Experience

2022 – 2023, **Reinforcement Learning Engineer**, Keybotic, remote
- Reinforcement learning for quadruped robot control. [python, ROS, IsaacGym]

2019 – 2022, **Senior Autonomy Engineer**, Sevendof, Norway
- UAV software 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
- Humanoid robot simulation, identification, motion planning, control. Development of in-house rigid body simulator. [C++, ROS]

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]

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]

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: Goldfarb-Idnani quadratic programming solver in C++
- https://github.com/asherikov/ariles: C++ reflection/serialization library supporting YAML, JSON, XML, ROS parameter server
- http://sherikov.net/Projects/naowalk.html: walking controller for Nao humanoid robot and specialized solvers for it (master's project)
- https://github.com/asherikov/ccws: ROS development environment for (cross-)compilation, testing, linting, documentation and binary package generation

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

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

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

Skills

Applied mathematics

Linear algebra / CAS	Eigen, Octave/MATLAB, Maxima
Numerical optimization	qpOASES, QuadProg++, ipopt, qpmad, LexLS (prioritized least squares), siconos (linear complementarity problems)

Simulation and learning

Dynamic modeling and control	RBDL (inverse kinematics and dynamics)
Simulators	Microsoft AirSim, Gazebo, IsaacGym
Visualization	RViz, OpenSceneGraph
Reinforcement learning	PyTorch, optuna, tensorboard

Robotics

Frameworks	ROS, Nao SDK
Motion planning	OMPL
Volumetric mapping	OpenVDB, OctoMap
UAV controllers	PX4, DJI, ArduPilot
Messaging	protobuf, mavlink, UAVCAN, CAN, mqtt
Sensors	lidar, GPS, ADS-B, IMU
Telemetry	time-series databases, Grafana, PlotJuggler
Hardware platforms	Raspberry Pi, NVIDIA Jetson Nano / Xavier

Programming and markup languages

C/C++	STL, Boost, C++XX, POSIX, pthreads
Parallel computations	CUDA/Thrust
Document preparation systems	LaTeX
Other	sh/bash, python

Programming tools

Compilers/compiler wrappers	clang, gcc, nvcc, ccache, scan-build
Version control systems	git, SVN
Debugging	gdb, lldb, strace
Static and dynamic checks	gcc/clang sanitizers, cppcheck, valgrind, clang-tidy, pylint, flake8
Profilers	callgrind, gprof
Testing	googletest, googlemock, Boost UTF, ctest
Build automation tools	catkin, colcon, cmake, make, autotools
Documentation	doxygen, PlantUML, graphviz
Packaging	FreeBSD ports, dpkg, CloudSmith, conan, vcpkg
Continuous integration	Jenkins, Travis
Web-based SCM	GitHub, GitLab, GForge, Gitea

Unix systems administration and networking

Operating systems	FreeBSD, Ubuntu
Isolation/emulation	docker, qemu, systemd-nspawn, VirtualBox
Service management	systemd, dinit
Computer networks	TCP/IP, VLAN, DHCP, DNS, SMTP, Ethernet, routing, switching
Time synchronization	NTP, PTP
Other	POSIX utilities

Languages

Russian (native), English (fluent)

Grants

2017, Torres Quevedo, Spain

- Torres Quevedo Program (PTQ) - Grants for recruiting PhDs
- https://www.ciencia.gob.es/stfls/eSede/Ficheros/2018/RESOLUCION_TORRES_QUEVEDO-2017-1.pdf

Academic activities

- Reviewer for IEEE T-RO, ICRA, IROS, Humanoids.
- Google Scholar page.

Participation in research projects

2016 – 2017, COMANOID

- COMANOID ("Multi-Contact Collaborative Humanoids in Aircraft Manufacturing") is a RIA four-year European research project that started in January 2015 as part of the Horizon H2020 program.
- http://comanoid.cnrs.fr/project-overview

2012 – 2016, Romeo 2

- Romeo 2 project is a french research project focusing on Romeo humanoid robot designed by Aldebaran Robotics.
- https://projetromeo.com/

2012 – 2012, SAUNA

- SAUNA is a major AASS 3-year project at Örebro University aimed at achieving international excellence in a research area of strong industrial relevance namely, safe autonomous navigation for professional industrial vehicles like forklift trucks, wheel loaders, mining trucks etc.
- https://www.oru.se/english/research/research-projects/rp/?rdb=p693

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. 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. Homsi, 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.