**Denis Osipychev**

Contact

Information

Huntsville e-mail: osipychev at gmail.com

AL, 35808, USA web: [www.denisos.com](http://www.denisos.com/)

Professional

Area

Autonomous systems architecture and hierarchical artificial intelligence

Control policy optimization, sequential task planning, deep reinforcement learning

Machine learning under constraints, generative modeling and synthetic data generation

Professional

Experience

*Boeing Research & Technology, Huntsville, Alabama USA 2018 – present*

AI Software Engineer

Active research in general autonomy, artificial intelligence, and decision-making.  
Autonomous reasoning and decision making for mission planning and risk mitigation. Local path planning, collision avoidance and optimization for UGV.

Navigation, mapping, and control of ROS based non-holonomic vehicle.

Data analysis and process optimization for composite manufacturing processes.

Worked on many aspects of AI from reinforcement learning, machine learning, and generative networks to planning, scheduling, and optimization.

*University of Illinois at Urbana-Champaign, Urbana, Illinois USA 2016 – 2018*

Research Assistant

Decision-making algorithms for modern agricultural robotics. Reinforcement learning for multi-agency optimization. Precision agriculture.

*Oklahoma State University, Stillwater, Oklahoma USA 2014 – 2016*

Human activity recognition, behavior modeling and classification.  
Decision-making algorithms for autonomous driving vehicles and human-in-the-loop systems.  
Learning from demonstration, imitation learning for robots.

Education

*University of Illinois at Urbana-Champaign, Urbana, Illinois USA*

Department of Ag and Bio Engineering

PhD candidate, Ag and Bio Engineering & Computational Science Engineering

*Advisors: Drs. G. Chowdhary, H. Tran, M. West, A. Davis*

*Oklahoma State University, Stillwater, Oklahoma USA*

M.S. in Electrical and Computer Engineering, Control Systems, 2015

*Moscow Power Engineering Institute, Moscow, Russia*

M.S. in Electronic Equipment, February, 2006

B.E. in Electronics, May, 2004

Top Projects

Local path planning, collision avoidance and optimization for UGV.

Navigation, mapping, and control of ROS based non-holonomic vehicle.

Publications

Osipychev D., Chowdhary G. - Distributed Deep Policy Sharing for Competitive Adversarial Environment. 2018 archived, NIPS Workshop ”Deep RL”

McAllister W., Osipychev D., Davis A. - Agbots: Weeding a field with a team of autonomous robots. 2019 – Elsevier

Publications

McAllister W.\*, Osipychev D.\*, Chowdhary G., Davis A., Multi-Agent Planning for Coordinated Robotic Weed Killing. 2018 IROS conference

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Osipychev D., Chowdhary G., Human - Reinforcement Learning Cooperation for Effective Solving

Unnatural Tasks. in preparation.

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• Tran D., Du J., Sheng W., Tadesse E., Osipychev D., Sun Y., Bai H., A Human-Vehicle Collab- orative Driving Framework for Driver Assistance. 2018 IEEE Intelligent Transportation Systems Transactions.

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• Tran, D., Tadesse, E., Osipychev, D., et al., A collaborative control framework for driver assis- tance systems. 2017 ICRA conference

• Denis Osipychev, D. Tran, W. Sheng, G. Chowdhary, Proactive MDP-based Collision Avoidance

Algorithm for Autonomous Car. 2015 IEEE CYBER Conference

• Denis Osipychev, D. Tran, W. Sheng, G. Chowdhary, Proactive MDP-based Collision Avoidance

Algorithm for Autonomous Car. 2014 NIPS Workshop ”From Bad Models to Good Policies”

Coding

Proficiency

• Experience in development and deployment of optimization algorithms:

- Deep RL agents (GA3C, DQN, PG, DDPG) based on Tensorflow/Theano libraries

- Various task-optimization methods (Q-learning, Policy Learning, Genetic/Evolutionary Algo- rithms, Tree/Graph Search, MDP, RRT)

- Various utility function optimization techniques (SGD, GD, Potential Fields, Elastic Bands, Particle Swarm, Leap-Frog).

- Various dynamic simulations (computer games, multi-agent systems, game theory, vehicle dynamics, construction equipment, quadrotors)

• Simulations of physical and control processes, visualizations and GUI.

• Languages: Python, C++, JavaScript, Matlab, LATEX