Denis Osipychev

CONTACT INFORMATION

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RESEARCH INTERESTS

Autonomous decision making algorithms for stochastic dynamical systems. Competitive and collaborative problem solving for multi-agent cooperation. Deep Reinforcement Learning, Deep Q-Network agents, policy optimization algorithms for task/path-planning in partially observable space.

ACADEMIC EXPERIENCE

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

Research Assistant **June, 2016 - present**

Task planning and optimization of a swarm of agricultural robots.
Decision making algorithms and policy optimizations for AI agents interacting with a human.
Deep Reinforcement Learning for computer game AI, Atari games and classic control problems.
Human-behavior modeling, adaptive model-based control for autonomous vehicles.
Collaborative multi-agent problem solving in a partially observable competitive environment.

Oklahoma State University, Stillwater, Oklahoma USA

Graduate Research Assistant **January, 2014 - May, 2016**

Sensing, control, path-planning and obstacle avoidance for mobile robots.
Decision making algorithms for autonomous driving simulations and real autonomous golf car.
Human activity recognition and classification.
On-line learning from demonstration for robots.

Top academic projects **2013 - 2018**

Multi-Agent Optimization in Simulated Agricultural Environment Weedworld
Competitive Planning for Convoy and Capture the Flag Problems
Competitive Policy for Human-Agent Collaboration
Golf Car Path-Planning and Control.
Model-Based Sequential Decision Making for Autonomous Cars.
Computer Vision-Based UAV Localization and Control.
Abnormal Behavior Detection for Collision Avoidance System.

EDUCATION

University of Illinois at Urbana-Champaign, Urbana, Illinois USA
Department of Agricultural and Biological Engineering
PhD student in Agricultural and Biological Engineering & Computational Science Engineering
- Advisor: Dr. Girish Chowdhary

Oklahoma State University, Stillwater, Oklahoma USA
M.S. in Electrical and Computer Engineering, Control Systems, 2015

Moscow Power Engineering Institute, Moscow, Russia
M.S., Electronic equipment, February, 2006
B.E., Electronics, May, 2004

PREVIOUS PROFESSIONAL EXPERIENCE

Philips Healthcare, Royal Philips Electronics, Russia/Netherlands

Senior Field Service Engineer **February, 2008 - August, 2013**

Technical screening and supporting MRI engineer's.

Bioline, Becton Dickinson, Russia

Field Service Engineer **June, 2006 - February, 2008**
Technical support for microbiology equipment.

Publications

- Osipychev D., Chowdhary G., Human - Reinforcement Learning Cooperation for Effective Solving Unnatural Tasks. *in preparation 2018 NIPS conference.*
- McAllister W.*, Osipychev D.*, Chowdhary G., Davis A., Multi-Agent Planning for Coordinated Robotic Weed Killing. *submitted 2018 IROS conference.*
- Osipychev D., Tran D., Chowdhary G., Sheng W., Use of Driver's Intention in Collision Avoidance for Autonomous Cars. *submitted 2018 IJRR journal*
- Tran D., Du J., Sheng W., Tadesse E., Osipychev D., Sun Y., Bai H., A Human-Vehicle Collaborative Driving Framework for Driver Assistance. *submitted 2017 IEEE Intelligent Transportation Systems Transactions.*
- Osipychev D., Duy T., Sheng W., Chowdhary G., Human Intention-Based Collision Avoidance for Autonomous Cars. *2017 ACC conference.*
- Tran, D., Tadesse, E., Osipychev, D., et al., A collaborative control framework for driver assistance 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 Skills

- Algorithms: Deep RL agents (GA3C, DQN), various task-planning algorithms (Q-learning, MDP, RRT, Search), various dynamic simulations (computer games, vehicles, quadrotors, construction equipment, multy-agent), various optimization techniques (SGD, GD, Potential Fields, Particle Swarm, Leap-Frog). Simulations of physical and control processes, visualizations and GUI.
- Languages: Python, C++, JavaScript, Matlab, LaTeX