

# Alexey Tregubov, Ph.D.

Computer Scientist, Machine Learning Engineer  
Los Angeles, CA

[alexeytregubov@gmail.com](mailto:alexeytregubov@gmail.com) | [atregubov.com](http://atregubov.com) | [www.linkedin.com/in/atregubov](http://www.linkedin.com/in/atregubov)

## Work Experience

---

<b>Computer Scientist   ML engineer</b>	<b>Information Sciences Institute USC, Los Angeles</b>	<b>01/2018 – present</b>
<ul style="list-style-type: none"><li>Developed synthetic data augmentation techniques for ML training using LLMs (<u>LLama 7b, GPT-4</u>). Improved classification precision (see selected publications).</li><li>Developed a Double oracle optimization framework (<u>game theory, MIP, Gurobi</u>) augmented with agent-based simulation and <u>GANs (DCGANs)</u>, which speeded up runtime performance by a factor of 11 (vs. average runtime without optimization).</li><li>Developed a distributed large-scale (10M agents) agent-based simulation framework FARM/DASH, which <u>won the SocialSim challenge</u>.</li><li>Designed and implemented ML models of human behavior on social networks (X/Twitter, YouTube, Reddit and GitHub) for a <u>high-impact program</u> on social network simulations and forecasting information spread online (<u>regression models, XGBoost, time series forecasting, ARIMA, LSTM</u>).</li><li>Set up model deployment infrastructure and simulation test beds. Led a team of 4 research engineers.</li></ul>		

---

<b>Lead Software Engineer</b>	<b>MSS-Holding Inc., Novosibirsk</b>	<b>06/2009 – 06/2012</b>
-------------------------------	--	--------------------------

### ***Systems for city's energy efficiency monitoring and control***

- Designed and developed a database for master data management (Oracle).
- Managed and led a team of 5 software developers (project's chief engineer) – Spring 2011-Summer 2012.

### ***System for operative monitoring of technological infrastructure for oil and gas fields***

- Designed algorithms for energy demand prediction based on consumption of power in transportation hubs.
- Designed and developed Java backend for Data Access Layer replacing Hibernate with custom ORM for performance improvement.

## Technical Skills

- 
- Programming Languages: Python (expert, 8+ years of experience), Java (expert, 10+ years of experience), C/C++, SQL
  - ML Frameworks & Libraries: TensorFlow, PyTorch, Scikit-learn, XGBoost, Keras, Gurobi, Llama 2, Code Llama
  - Cloud Platforms: AWS, Docker, Kubernetes
  - Data Preprocessing & Engineering: feature engineering, data cleaning and augmentation, pipeline design
  - Model Development & Evaluation: model selection, hyperparameter tuning, cross-validation, metrics analysis, interpretability techniques, large-scale data processing and model training using distributed frameworks

## Leadership

- 
- Full-time project chief engineer (team leader, requirement engineer), 2011-2012
  - Lead and collaborated with both fully remote and on-site teams.
  - Mentored junior engineers and researchers via DataFirst program at USC, 2023-present

## Education

---

<b>Los Angeles, CA</b>	<b>University of Southern California</b>	<b>2012 – 2017</b>
<ul style="list-style-type: none"><li><u>Ph.D. in Computer Science</u>, Software Engineering. GPA: 4.0/4.0 Research field: Quantitative methods of SW project effort and schedule estimation (adviser Dr. B.Boehm)</li></ul>		
<b>Novosibirsk, Russia</b>	<b>Novosibirsk State University</b>	<b>2005 – 2011</b>
<ul style="list-style-type: none"><li>M.S. in Computer Science, 2011. GPA: 4.96/5.0</li><li>B.S. in Computer Science, 2009. GPA: 4.96/5.0</li></ul>		

# Alexey Tregubov, Ph.D.

Computer Scientist, Machine Learning Engineer  
Los Angeles, CA

[alexeytregubov@gmail.com](mailto:alexeytregubov@gmail.com) | [atregubov.com](http://atregubov.com) | [www.linkedin.com/in/atregubov](http://www.linkedin.com/in/atregubov)

## Selected Publications

---

1. **Modeling cognitive workload in open-source communities via simulation.** Tregubov, A.; Abramson, J.; Hauser, C.; Hussain, A.; and Blythe, J. In AAMAS International Workshop on Multi-Agent-Based Simulation, 2023.
2. **Dynamic graph reduction optimization technique for interdiction games.** Blythe, J.; and Tregubov, A. In AAMAS Workshop on Optimization and Learning in Multiagent Systems, 2022.
3. **Large-scale agent-based simulations of online social networks.** Murić, G.; Tregubov, A.; Blythe, J.; Abeliuk, A.; Choudhary, D.; Lerman, K.; and Ferrara, E. *Autonomous Agents and Multi-Agent Systems*, 36(2): 38. 2022. *Top conference: Google Scholar H5-index: 25, acceptance rate 24%*
4. **Optimization of Large-scale Agent-based Simulations through Automated Abstraction and Simplification,** Tregubov A., Blythe J., In Proceedings of International Conference on Autonomous Agents and Multi-Agent Systems, May 2020. *Top conference: Google Scholar H5-index: 25, acceptance rate 24%*
5. **The DARPA SocialSim Challenge: Cross-platform Multi-Agent Simulations,** Muric G., Tregubov A., Blythe J., Ferrara E., In Proceedings of International Conference on Autonomous Agents and Multi-Agent Systems, May 2020. *Top conference: Google Scholar H5-index: 25, acceptance rate 24%*
6. **The DARPA SocialSim Challenge: Massive Multi-Agent Simulations of the Github Ecosystem,** Blythe J., Ferrara E., Lerman K., Tregubov A., Muric G., In Proceedings of International Conference on Autonomous Agents and Multi-Agent Systems, 13th-17th of May 2019. *Top conference: Google Scholar H5-index: 25, acceptance rate 25%*
7. **Massive Multi-Agent Data-Driven Simulations of the GitHub Ecosystem,** Blythe J., Ferrara E., Lerman K., Tregubov A., Muric G., In Proceedings of International Conference on Practical Applications of Agents and Multi-Agent Systems, 26th-28th June, 2019.
8. **FARM: Architecture for Distributed Agent-based Social Simulations,** Blythe J., Tregubov A., In Proceedings of International Workshop on Massively Multi-Agent Systems, July 14th, 2018.
9. **Impact of Task Switching and Work Interruptions on Software Development Processes,** Tregubov A., Boehm B., Rodchenko N., Lane, J.A.; In Proceedings of International Conference on Software and Systems Process (ICSSP'17), Paris, France, 5-7 July, 2017. *Top conference: Google Scholar H5-index: 15, acceptance rate 21.9%*
10. **Evaluation of cross-project multitasking in software projects,** Tregubov A., Lane, J.A., Boehm B.; Conference on Systems Engineering Research (CSER'17), Los Angeles, CA, 23-25 March, 2017.
11. **What does it mean to be Lean in SoSE environment?** Tregubov A., Lane, J.A.; 26th Annual INCOSE International Symposium (IS'16) Edinburgh, Scotland, UK, July 18-21, 2016.
12. **Simulation of Kanban-based scheduling for systems of systems: initial results,** Tregubov A., Lane, J.A.; Conference on Systems Engineering Research (CSER'15), Hoboken, NJ, 17-19 March, 2015.