# Tetiana Parshakova

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**OBJECTIVE**

To develop novel learning algorithms using techniques from optimization and statistics, to bring theoretical guarantees about the convergence of iterative methods and the quality of the produced solutions, and to obtain the control models in the approximate dynamical system environments

**EDUCATION**

**Doctor of Philosophy**, Computational and Mathematical Engineering, *from Sep 2019*
Stanford University
Concentration: Machine Learning

**Master of Science**, Electrical Engineering, Feb 2017 - Feb 2019
Korea Advanced Institute of Science and Technology
Concentration: Machine Learning, GPA: 4.06/4.3 (97.33%)
Laboratory: Brain Reverse Engineering and Imaging Lab, supervised by Dae-Shik Kim

**Bachelor of Science**, Industrial Design, Sep 2012 - Feb 2017
Korea Advanced Institute of Science and Technology
Concentration: Computer Human Interaction; *Magna Cum Laude*, GPA: 3.85/4.3 (95%)
Laboratory: My Design Lab, supervised by Daniel Saakes

**High School**, Mathematics, Sep 2009 - May 2012
Ukrainian Lyceum of Physics and Mathematics of Taras Shevchenko National University of Kyiv
Concentration: Mathematics, Computer Science; *Gold Medal*

**PUBLISHED WORK**

**JOURNAL**

**Tetiana Parshakova**, Francois Rameau, Andriy Serdega, In So Kweon and Dae-Shik Kim. *Latent Question Interpretation Through Variational Adaptation.* Accepted in IEEE/ACM Transactions on Audio, Speech, and Language Processing. 2019

**CONFERENCE**

**Tetiana Parshakova**, Marc Dymetman and Jean-Marc Andreoli. *Distributional Policies for Energy-Based Sequential Models.* NeurIPS Optimization Foundations of Reinforcement Learning Workshop. 2019

**Tetiana Parshakova**, Jean-Marc Andreoli and Marc Dymetman . *Global Autoregressive Models for Data-Efficient Sequence Learning.* In Proceedings of the SIGNLL Conference on Computational Natural Language Learning, ACL. 2019

**Tetiana Parshakova** and Dae-Shik Kim. *Latent Question Interpretation Through Parameter Adaptation Using Stochastic Neuron.* In Proceedings of ICML Workshop, MRC-2018, http://ceur-ws.org/Vol-2134/#paper07. 2018

**Tetiana Parshakova** and Daniel Saakes. *UMorph: Self-Change Tracker to Reflect Yourself to the Future and Past.* In Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems, ACM. 2018

**Tetiana Parshakova**, Minjoo Cho, Alvaro Cassinelli, and Daniel Saakes. *Furniture that Learns to Move Itself.* In Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems, ACM. 2017

**Tetiana Parshakova**, Minjoo Cho, Alvaro Cassinelli, and Daniel Saakes. *Ratchair: Furniture learns to move itself with vibration.* In ACM SIGGRAPH 2016 Emerging Technologies, ACM. 2016

**RESEARCH EXPERIENCE**

*Researcher* 2019
Worked with Marc Dymetman and Jean-Marc Andreoli, Naver Labs Europe, France

- Introduce the concept and training techniques for GAMs (Global Autoregressive Models), which combine an autoregressive component with a log-linear component, allowing the use of global a priori features to compensate for lack of data.
- Derive different approaches for approximating the normalized distribution given by GAMs, for fast inference (namely sampling).

*Graduate Researcher* 2017-2018
Brain Reverse Engineering and Imaging Lab, KAIST, South Korea

- "Latent Question Interpretation Through Variational Adaptation", a model that learns multiple interpretations of a given question. This diversity is ensured by our "interpretation policy" which automatically adapts the parameters of a QA model with respect to a discrete latent variable (using PyTorch).
- "Visual Question Answering" model with bottom-up and top-down attention. Explored the influence of policy gradient and new attention on the output layer; ways to align image features with text information to obtain image-aware question representation (using PyTorch).
- "Abstractive Text Summarizer", a model that combines Pointer generator networks with Seq2seq attention model, by constructing a hybrid distribution over the vocabulary from which it eventually generates the summary. Explored the effectiveness of CNN attention, diversity loss and data augmentation (with English dictionary) (using Tensorflow).
- "DDPG with Attention-based LSTM State Encoder" is a sequential decision making agent for solving 'Angry Birds' using Deep Deterministic Policy Gradient (DDPG) with Attention-based LSTM for state encoding. For exploration with a deterministic policy we use actor-critic algorithm for learning off policy with a stochastic behavior policy (using Tensorflow).
- "Opinion Generator" is a model, which aims to capture a global 'pathway' of an opinion as a response to other statement. It consists of CNN encoders, that operate on character level, and whose outputs are given to recurrent block to combine sentences over time, so that the produced context representations are used to condition the CNN decoder (using Tensorflow).

*Undergraduate Researcher* 2016
Brain Reverse Engineering and Imaging Lab, KAIST, South Korea

- Machine Learning and Reinforcement Learning basics
- Worked on "Comic style generation using neural networks" using Lua and Torch

*Undergraduate Researcher* 2015-2016
My Design Lab, KAIST, South Korea

- "Ratchair" is a strategy for displacing objects utilizing vibrations, `http://mid.kaist.ac.kr/projects/ratchair/`. Used: Python, Java, Android, OpenCV, Arduino, Inventor, Processing-Android, Myo Armband, hardware
- "UMorph" is an unobtrusive self-image capturing system for tracking self changes over time. Used: PyQt, Dragon Board 410c, OpenCV, Dlib, hardware

## HONORS & AWARDS

The Oliger Memorial Fellowship, a stipend during P.h.D. at Stanford. 2019-2022

Qualcomm-KAIST Innovation Awards 2018 (Paper Competition Awards for Graduate Students) for "Latent Question Interpretation Through Parameter Adaptation Using Stochastic Neuron" 2018

"Ratchair: Furniture That Learns to Move Itself" demonstration for Discovery Daily Planet Canada show 2017

"Furniture That Learns to Move Itself" featured in KAIST Breakthroughs Newsletter 2017

Excellence Award for Bachelor's thesis "UMorph: Self-Change Tracker to Reflect Yourself to the Past and to the Future" 2017

First prize in Qualcomm-KAIST Innovation Awards 2016 (Embedded Systems Awards) for "My Life Journey (Unobtrusive Self-Image Capturing System for Tracking Self Changes over Time)" 2016

SIGGRAPH 2016 Emerging Technologies DC EXPO Special Prize for "Ratchair: Furniture That Learns to Move Itself With Vibration" 2016

Undergraduate Research Program Excellence Award for Extraordinary Efforts and Research Outcomes 2016

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| | KAIST International Student Scholarship | 2012-2016, 2017-2019 |
| | Bronze medals at Kyiv Capital Olympiads in Mathematics, Ukraine | 2009, 2012 |
| | Silver medal at Regional Mathematics Olympiad | 2009 |
| | Participant of Ukrainian Olympiad in Mathematics | 2008 |
| | Gold medal at Volyn Regional Mathematics Olympiad | 2008 |

**COMPUTER SKILLS**

*Languages & Software:* Python, Java, Torch, Tensorflow, PyTorch, Git, LaTeX, OpenCV.
*Prototyping:* Raspberry Pi, Arduino, Processing-Android, Inventor.
*Operating Systems:* Unix.

**EXTRA-CURRICULAR**

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| Tutor at EE Co-op program. Prepared undergraduate students for internship at Kakao in Natural Language Processing using Deep learning. Taught basic Machine Learning, Tensorflow and research papers related to Neural Machine Translation. | 2018 |
| Tutor in science camp for high school students. Helped to prepare for a science competition. | 2017, 2018 |
| Participated in student liaison for KAIST EE promotion in Ukraine. Recruited students in Ukraine and helped to organize EE Visit Camp. | 2017 |
| Tutor in English Camp for elementary and middle school children in Yeonggwang. | 2017, 2018 |
| Teaching Assistant at KAIST: Introduction to Philosophy, English Short Stories, Philosophy of Mathematics, Logic and Artificial Intelligence | 2015, 2016 |
| Volunteer at UEFA Euro 2012. Participated in closing ceremony dance performance in Kyiv. | 2012 |
| Candidate Master of Sports in Sports Acrobatics. | 2001-2007 |