Elena Tuzhilina

Phone: +1 (647) 482-91-61
E-mail: elena.tuzhilina@utoronto.ca
Web: elenatuzhilina.github.io

EMPLOYMENT

Academic

June 2022 – current, *Department of Statistical Sciences, University of Toronto*, Toronto, Canada
Assistant Professor in Statistics (tenure-track)

Industrial

June 2021 – August 2021, *Microsoft*, Redmond, USA
Intern in Data Science

October 2015 – September 2017, *SmartCAT*, Moscow, Russia
Researcher in Computer Linguistics

EDUCATION

September 2017 – June 2022, *Department of Statistics, Stanford University*, Stanford, USA
Ph.D. in Statistics [Advisor: Trevor Hastie]
Thesis: Advances in multivariate statistics and its applications

September 2015 – June 2017, *Department of Data Analysis, Yandex School of Analysis*, Moscow, Russia
Two-year program in Data Science [Advisors: Ilya Muchnik, Boris Polyak, Anatoliy Michalskiy]

September 2015 – left in 2017, *Faculty of Mechanics and Mathematics, Moscow State University*, Moscow, Russia
Ph.D. in Mathematics [Advisors: Andrey Raigorodsky, Alexander Bulinski]

September 2010 – June 2015, Faculty of Mechanics and Mathematics, Moscow State University, Moscow, Russia
B.Sc and M.Sc. in Mathematics [Advisor: Alexander Bulinski]
GPA: 5.0 out of 5.0 (with highest distinction)

FUNDING

2023 – 2028, Discovery Grant, *Natural Sciences and Engineering Research Council of Canada*.

2023 – 2024, Accelerator Grant, *The University of Toronto McLaughlin Centre*.

2022 – 2024, Catalyst Grant, *The University of Toronto Data Sciences Institute*.

2020 – 2022, Stanford Data Science Scholarship, *Stanford University*.

2016 – 2018, Grant supporting the SmartCAT project, *Skolkovo Institute of Science & Technology*.

2014 – 2017, Grant supporting research on amino acids conformations, *Russian Science Foundation*.

ACADEMIC AWARDS

2023, Dorothy Shoichet Women Faculty in Science Awards of Excellence, *University of Toronto*.

2022, Student Travel Award, *Joint Statistical Meeting, SFASA*.

2022, Best poster award, *Statistics in the Big Data Era conference, Simons Institute*.

2022, Outstanding Teaching Assistance Award, *Stanford University*.

2021, Stanford Teaching Assistant Award, *Stanford University*.

RECENT PUBLICATIONS

2022, “Statistical curve models for inferring 3D chromatin architecture”, **E.Tuzhilina**, T.Hastie, M.Segal, *submitted to Annals of Applied Statistics*.

2022, “Smooth multi-period forecasting with application to prediction of COVID-19 cases”, **E.Tuzhilina**, T.Hastie, D.McDonald, K.Tay, R.Tibshirani, *submitted to Journal of Computational and Graphical Statistics*.

2022, “Principal Component Analysis”, M.Greenacre, P.Groenen, T.Hastie, A.D’Enza, A.Markos, **E.Tuzhilina**, *Nature Reviews Methods Primers*.

2021, “Weighted Low Rank Matrix Approximation and acceleration”, **E.Tuzhilina**, T.Hastie, *available from ArXiv*.

2021, “An Open Repository of Real-Time COVID-19 Indicators”, A. Reinhart, L. Brooks, M. Jahja, A.Rumack, J.Tang, W. Saeed, T.Arnold, A.Basu, J.Bien, A.Cabrera, A.Chin, E.Chua, B.Clark, N.DeFries, J.Forlizzi, S.Gratzl, A.Green, G.Haff, R.Han, A.Hu, S.Hyun, A.Joshi, J.Kim, A.Kuznetsov, W.Motte-Kerr, K.Lee, Y.Lee, Z.Lipton, M.Liu, L.Mackey, K.Mazaitis, D.McDonald, B.Narasimhan, N.Oliveira, P.Patil, A.Perer, C.Politsch, S.Rajanala, D.Rucker, N.Shah, V.Shankar, J.Sharpnack, D.Shemetov, N.Simon, V.Srivastava, S.Tan, R.Tibshirani, **E.Tuzhilina**, A.Nortwick, V.Ventura, L.Wasserman, J.Weiss, K.Williams, R.Rosenfeld, R.Tibshirani, *Proceedings of the National Academy of Sciences*.

2021, “Canonical Correlation Analysis in high dimensions with structured regularization”, **E.Tuzhilina**, L.Tozzi, T.Hastie, *Statistical Modelling SAGE*.

2021, “Relating whole-brain functional connectivity to self-reported negative emotion in a large sample of young adults using group regularized canonical correlation analysis”, L.Tozzi, **E.Tuzhilina**, M. Glasser, T.Hastie, L.Williams, *NeuroImage*.

2020, “Principal curve approaches for inferring 3D chromatin architecture”, E.Tuzhilina, T.Hastie, M.Segal, Biostatistics.

2017, “Analyzing the Data Bank of Proteins Space Structures (PDB); A Geometrical Approach”, **E.Vilkul**, A.Ivanov, A.Mishchenko, F.Popelensky, A.Tuzhilin, K.Shaitan, *Springer, Journal of Mathematical Sciences*, 225, number 4, pp. 555–564.

PATENTS

2019, “Data-driven automated selection of profiles of translation professionals for translation tasks”, A.Ukrainets, V.Gusakov, I.Smolnikov, **E.Tuzhilina**, *patent number US20190065463*.

2018, “System and method of intellectual automatic selection of performers of translation”, A.Ukrainets, **E.Tuzhilina**, V.Gusakov, I.Smolnikov, *patent number RU2667030*.

SOFTWARE

RCCA (R package) Implementation of regularized canonical correlation analysis with structured data. Includes three modifications: with standard L2 penalty, with partial L2 penalty, and with group penalty.

WLRMA (R package) Performs weighted low-rank matrix approximation. Allows to solve both rank-constraint problem as well as its convex relaxation.

PoisMS and DBMS (R packages) Allows to compute 3D chromatin reconstruction using a contact matrix. The approach is based on principal curve technique modeling the chromatin directly by a smooth curve.

MENTORING

Undergraduate

September 2023 – December 2023, Jin Qin, “Statistical learning: methods and applications”, *Department of Statistical Sciences, University of Toronto, Canada*.

January 2023 – present, Anna Kosovskaya, “Low-rank matrix approximation and applications”, *Department of Mathematics, High School of Economics, Russia*.

Graduate

November 2023 – present, Nikita Glukhov, “Statistical methodology for chromatin conformation reconstruction”, *Department of Computer Science, Skolkovo Institute of Science and Technology, Russia*.