

Boris Knyazev

(pronounced “k-nya-zev”)
*Research Scientist at Samsung AI Lab Montreal
Adjunct Professor at University of Montreal*

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Status in Canada: Citizen



RESEARCH EXPERTISE Relational and graph-structured learning, optimization and efficient training, training and inference of large language models (LLMs), reasoning and scientific discovery

TEAM LEADING EXPERTISE

- Mentoring and supervising of 10+ graduate students at Mila
- Leading internal Samsung projects on LLMs

EDUCATION

PhD, University of Guelph Guelph (Ontario), Canada
Machine Learning Research Group **2017 - 2022**
Thesis: Assessing and Improving Generalization in Graph Reasoning and Learning
Advisor: Graham W. Taylor
Teaching assistant: 2017-2019
Scholarships: IGTS, OGS, Dean's scholarship

MSc, Bauman Moscow State Technical University Moscow, Russia
Diploma with Honors in Information Technology, *GPA: 4.8/5.0* **2005 - 2011**
Scholarships: German Academic Exchange Service (DAAD)

PROFESSIONAL EXPERIENCE

University of Montreal Montreal, Canada
Adjunct professor, DIRO **Feb 2025 - present**

Samsung AI Lab Montreal, Canada
Research Scientist (full time) **Nov 2021 - present**

- Projects: LLMs, improving mixtures of experts, material discovery
- Manager: Simon Lacoste-Julien

Facebook AI Research Montreal, Canada
Research Intern (full time) **Summer 2020**

- Project: Parameter Prediction for Unseen Deep Architectures
- Advisors: Adriana Romero and Michal Drozdzal

Mila & University of Montreal Montreal, Canada
Research Intern (full time) **2019 - 2020**

- Project: Compositional generalization in scene graphs
- Advisors: Eugene Belilovsky and Aaron Courville

NextAI Toronto, Canada
Scientist in Residence (part time) **2018 - 2019**

- Consulting startup teams

SRI International Princeton, NJ, USA
Research Intern (full time) **Summer & Fall 2018**

- Project: Graph neural networks for classification of images and other modalities
 - Advisor: Mohamed R. Amer
 - Awards: Top-2 in all interns poster presentations

Institute for Neuro- and Bioinformatics, University of Luebeck Luebeck, Germany
Visiting researcher 2015 - 2016

- Project: High-performance image classification with small training data sets
 - Advisors: Thomas Martinetz and Erhardt Barth

**SELECTED
PUBLICATIONS**

COMPLETE LIST:
GOOGLE SCHOLAR LINK

- Li Y, Cloutier F, Wu S, Parviz A, **Knyazev B**, Zhang Y, Berseth G, Bang L. Mol4Gen: Multi-Agent, Multi-Stage Molecular Generation under Precise Multi-Property Constraints. **Under review**, 2025.
 - Qin G, Gupta R, **Knyazev B**, Zhang Y, Berseth G, Bang L. Concept-Based Steering of LLMs for Conditional Molecular Generation. **Under review**, 2025.
 - Moudgil A, **Knyazev B**, Belilovsky E. Towards Learned Optimization Free Lunch. **Under review**, 2025.
 - Jolicoeur-Martineau A, Baratin A, Kwon K, **Knyazev B**, Zhang Y. Any-Property-Conditional Molecule Generation with Self-Criticism using Spanning Trees. **TMLR**, 2025, arXiv.
 - Singh J, Misra D, **Knyazev B**, Orvieto A. (Almost) Free Modality Stitching of Foundation Models. **EMNLP** (Main track), 2025, arXiv.
 - Knyazev B**, Moudgil A, Lajoie G, Belilovsky E, Lacoste-Julien S. Accelerating Training with Neuron Interaction and Nowcasting Networks. **ICLR**, 2025, arXiv.
 - Joseph C-E, Thérien B, Moudgil A, **Knyazev B**, Belilovsky E. Meta-learning Optimizers for Communication-Efficient Learning. **TMLR**, 2025, arXiv.
 - Moudgil A, **Knyazev B**, Lajoie G, Belilovsky E. Learning Versatile Optimizers on a Compute Diet. **TMLR** (J2C Certification), 2025, arXiv.
 - Thérien B, Joseph C-E, **Knyazev B**, Oyallon E, Rish I, Belilovsky E. μ LO: Compute-Efficient Meta-Generalization of Learned Optimizers. **NeurIPS OPT Workshop (oral)**, 2024, arXiv.
 - Kofinas M, **Knyazev B**, Zhang Y, Chen Y, Burghouts G.J., Gavves E, Snoek C.G., Zhang D.W. Graph Neural Networks for Learning Equivariant Representations of Neural Networks. **ICLR (oral)**, 2024, arXiv.
 - Knyazev B**, Hwang D, Lacoste-Julien S. Can We Scale Transformers to Predict Parameters of Diverse ImageNet Models? **ICML**, 2023, arXiv.
 - Schürholz K, **Knyazev B**, Giró-i-Nieto X, Borth D. Hyper-Representations as Generative Models: Sampling Unseen Neural Network Weights. **NeurIPS**, 2022, arXiv.
 - Thompson R, **Knyazev B**, Ghalebi E, Kim J, Taylor G.W. On Evaluation Metrics for Graph Generative Models. **ICLR**, 2022, arXiv.
 - Knyazev B**, Drozdal M, Taylor G.W., Romero-Soriano A. Parameter Prediction for Unseen Deep Architectures. **NeurIPS**, 2021, arXiv.
 - Chung H, Kim J, **Knyazev B**, Taylor G.W., Lee J, Park J, Cho M. Brick-by-Brick: Sequential 3D Object Construction with Deep Reinforcement Learning. **NeurIPS**, 2021, arXiv.
 - Knyazev B**, de Vries H, Cangea C, Taylor G.W., Courville A, Belilovsky E. Compositional Augmentations for Scene Graph Generation. **ICCV**, 2021, arXiv.
 - Lu Y, Rai H, Chang C, **Knyazev B**, Yu G, Shekhar S, Taylor G.W., Volkovs M. Context-aware Scene Graph Generation with Seq2Seq Transformers. **ICCV**, 2021, iccv.
 - Knyazev B***, Augusta C*, Taylor G.W. Learning Temporal Attention in Dynamic Graphs with Bilinear Interactions. **PLOS One**, 2021, arXiv.

- **Knyazev B**, de Vries H, Cangea C, Taylor G.W., Courville A, Belilovsky E. Graph Density-Aware Losses for Novel Compositions in Scene Graph Generation. **BMVC**, 2020, arXiv.
- **Knyazev B**, Lin X, Amer M.R., Taylor G.W. Image Classification with Hierarchical Multigraph Networks. **BMVC**, 2019, arXiv.
- **Knyazev B**, Taylor G.W., Amer M.R. Understanding Attention and Generalization in Graph Neural Networks. **NeurIPS**, 2019 (also a *contributed talk*, 4% accept. rate, at *ICLR Workshop on Representation Learning on Graphs and Manifolds*), arXiv.