

# VLADIMIR SKAVYSH

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## CORE COMPETENCIES:

- ❖ **Leadership and Project Management:** full program and project lifecycle in innovative technologies
  - ❖ **Advanced Data Science & Behavioural Modelling:** large language models (LLMs), reinforcement learning, deep learning (PyTorch, TensorFlow), big data (Spark, Dask, GPU), agent-based behavioural modelling, regressions and decision trees, fat-tailed distributions; user segmentation based on geography and other characteristics
  - ❖ **Cloud & HPC:** proficient with Azure, GCP, AWS, GPU acceleration (CUDA, RAPIDS, Numba), parallel computing; code optimization
  - ❖ **Fintech and central banking:** financial risk modelling, TransUnion credit data, macro-dynamics, cryptocurrency research, hands-on Forex trading
  - ❖ **Quantum & Emerging Tech:** leader and creator of Bank of Canada's Quantum Lab for Advanced Analytics, quantum solutions for research and policy problems
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## PROFESSIONAL EXPERIENCE:

**Bank of Canada | Senior Data Scientist & Leader of Quantum Lab for Advanced Analytics (7 years)**

### *Data Science & Technical Leadership*

Pioneered data science for economic and financial use cases to analyse human behavior, optimize operations, and accelerate computations:

- » developed and deployed **LLM chatbots** for protected data
- » derived **causal relationships** from **macroeconomic data** using AI
- » detected anomalous **crypto** trading activity on Binance using Twitter data
- » predicted household defaults using geographical, banking, and credit registry **big data**
- » analysed **market microstructure** of centralized cryptocurrency exchanges
- » estimated impact of **digital currency** on wholesale payments
- » predicted business **defaults** using **extreme value theory** and **synthetic data**
- » classified **thousands of consumer products** using **decision trees** and AI
- » used **Deep Learning and GPUs** for stochastic macroeconomic modelling
- » used newspaper articles for **nowcasting** of economic trends with **LLMs**

- » compared performance of LLMs vs. humans for **error detection** in economics
- » optimized **payments queue** in a large-value payment system
- » spearheaded **GPU/HPC/Cloud** implementations to accelerate computations
- » **advised on emerging technology** trends and policy
- » **trained** economists and data scientists in AI, big data, and quantum computing

### *Management & Stakeholder Engagement*

- Created and developed quantum computing innovation lab driving stakeholder engagement among cross-functional teams
- Managed data scientists and interns, hired diverse teams based on merit
- Defined and managed roadmaps, budgets, contracts
- Designed RFPs, selected top-tier vendors and solutions
- Established midterm research plans and managed project lifecycles
- Led cross-team and external collaborations securing new partnerships and funding
- Delivered complex products in a clear and concise manner

### **Cogniframe | External Consultant and Developer (Large Language Models) (3 months)**

- Developed LLMs using internet search data for a cyber security application
- Mentored and trained data scientists on quantum computing

### **Triumvir Technologies | External consultant (Deep Learning Vision Models) (6 months)**

- Guided development of computer vision models for drones in agriculture
- Advised on cloud computing, data pipelines, and deep learning

### **National Institute of Standards and Technology and Center for Exploration of Energy and Matter | Physicist (1.5 years)**

- Developed gravity and dark energy theories, computational solutions, experiments
- Used neutron interferometry to test theoretical predictions in the lab

### **Sole Proprietor | Foreign Exchange Currency Trader (3 years)**

- Day-traded currencies, options, futures, and stocks
- Developed trading and risk strategies centered around news events

### **KHS Analytics | Startup Early Contributor (6 months)**

- Worked with mathematical and statistical models for digital analytics product
- Advised on outreach strategies and delivered client-facing presentations

## EDUCATION:

**Ph.D. in Physics (ABD)**, North Carolina State University

**M.S. in Physics**, Indiana University Bloomington

**B.S. in Physics & Mathematics**, University of Illinois at Chicago

## LEADERSHIP AND SOFT SKILLS TRAINING:

- Google Project Management Course for Professional Certification
- Project Management Professional (PMP) Certification Course, TIA Education
- Emerging Leaders Program, Bank of Canada & DDI
- Competencies training: Effective Professional Writing, Dynamic Presentations, Powerful Negotiation Skills (Performance Management Consultants)

## SKILLS IN TECHNOLOGIES:

Complete data science workflow (understanding the business problem, data collection and analysis, model training, deployment, and maintenance).

Programming	Python, SQL, C/C++, R, Scala, Fortran
Deep learning	Pytorch, Tensorflow, Keras
Databases	CosmosDB
Big data	Spark, Dask, Polars, Modin, RAPIDS
Cloud Platforms	Azure, Google Cloud, AWS
Version control	GIT, SVN
Visualization & Reporting	Matplotlib, Geopandas, Plotly, Bokeh, Blender, Tableau, Power BI, LaTeX/Overleaf; 3D, interactive graphs, geographical visualizations
GPGPU	CUDA (C, Python, Fortran), Numba, Cluster orchestration
Scientific computing	Python Scientific Stack (NumPy, pandas, scikit-learn, Jupyter, etc.), MATLAB, Mathematica, Maple, Julia, VASP, SINDy
Quantum Computing	PennyLane, Qiskit, D-Wave Ocean, Cirq, Tensorflow quantum

## PUBLIC SPEAKING AND ENGAGEMENTS:

**Keynote Speaker:** Qubits D-Wave Conference & Q-SITE Conference

**Innovation Engagements:** UoT Creative Destruction Lab for AI/Crypto/Quantum

**Presentations:** over ten presentations at central banks, conferences, and universities

**University Teaching:** 3 semesters in North Carolina State University (2016)

12 semesters in Indiana University Bloomington (2008-10)

**Charity Engagement:** United Way Bank of Canada Campaign Coordinator

## PUBLICATIONS & RESEARCH:

### Artificial Intelligence, Quantum Computing, Economics

1. Imbalanced Product Description Classification using One-vs-All and Data Augmentation (2025) with Noorani, N., Wang, S., Gu, J. and Sarkar, A.
2. Large Language Model Oracle for Inflation Expectations (2025) with Ashtari, M., Houle, S., McKelvey, P., Richmond, A. and Shatalova, A.
3. Discovering Model Dynamics from Economics Data with SINDy (2025) with Alakhras, S., Brault, J. and Fernandes, S.
4. Simulating Economic Fat Tail Distributions with Quantum Boltzmann Machines (2025, in press), *Journal of Economic Dynamics and Control*, with Noorani, N., Astuti, V., Bruno, G. and Ergun, L.
5. Comparison of Human, AI-Assisted, and Quasi-Automated Approaches to Research Reproducibility (2025) with Brodeur, A., et al.
6. Quantum Natural Language Processing for Classification of Receipt Descriptions (2025), with Noorani, N., Blanchette, S., Chikhar, O., Laprade, J., Wang, S., Zanussi, Z. and Molladavoudi, S.
7. Improving the Efficiency of Payments Systems Using Quantum Computing (2024), *Management Science*, with McMahon, C., McGillivray, D., Desai, A., Rivadeneyra, F., Lam, J. P., Lo, T., and Marsden, D.
8. Digital Payments in Firm Networks: Theory of Adoption and Quantum Algorithm (2024), *Bank of Canada Working Paper*, with Priazhkina, S., Palmer, S., Martín-Ramiro, P., Orús, R., and Mugel, S.
9. Market Structure of Cryptoasset Exchanges: Introduction, Challenges, and Emerging Trends (2024), *Bank of Canada Staff Analytical Note*, with Sharples, J., Priazhkina, S., and Hasham, S. H.
10. Quantum Monte Carlo for Economics: Stress Testing & Macroeconomic Deep Learning (2023), *Journal of Economic Dynamics and Control*, with Priazhkina, S., Guala, D., and Bromley, T. R.
11. Quantum Variational Rewinding for Time Series Anomaly Detection (2022), *arXiv*, with Baker, J. S., Horowitz, H., Radha, S. K., Fernandes, S., Jones, C., Noorani, N., Lamontagne, P., and Sanders, B.
12. Deep Learning Solutions for Dynamic Stochastic General Equilibrium Models (2022), *Bank for International Settlements IFC Bulletin*, with Ashtari, M.

### Physics/other science:

13. Neutron limit on the strongly-coupled chameleon field (2016), *Physical Review D*, with Li, K. et. al.
14. Decoupling of a neutron interferometer from temperature gradients (2016), *Review of Scientific Instruments*, with Saggu, P. et al.

15. A sensitive search for dark energy through chameleon scalar fields using neutron interferometry (2015). *Journal of Physics: Conference Series*, with Snow, W. et al.
16. Search for Lorentz violation in a short-range gravity experiment (2011). *CPT And Lorentz Symmetry*, with Bennett and D. Long, J.
17. Preferential growth of Pt on rutile TiO<sub>2</sub> (2006), *Physical Review B—Condensed Matter and Materials Physics*, with Iddir, H., Ögüt, S., Browning, N., and Disko, M.

**PERSONAL:**

- Married, 5 years old daughter
- Languages: English (native), Russian (native), Polish (native), French (basic)
- Hobbies: chess (~2250 Elo) and Go (~1 dan); piano; solving games with multiagent reinforcement learning; debating the future of AI