Timur Rizvanov

Boston, MA | (857) 639-0871 | timurr@bu.edu | linkedin.com/in/timurrizvanov | github.com/TiRizvanov

Education

Boston University — Boston, MA
Bachelor of Arts in Chemistry and Computer Science (Double Major) — *Expected May 2027*
Related Graduate Coursework: Advanced Optimization Algorithms; GPU Programming in CUDA/C++; Molecular Quantum Mechanics III.
Related Undergraduate Coursework: Advanced Organic Chemistry 1, 2; Quantum Mechanics; Instrumental Analysis Laboratory.

Research Experience

Bravaya Lab - Boston University — Boston, MA
Machine Learning & Computational Chemistry Researcher - Protein Electron Transfer — *September 2025 - Present*

- Built deep-learning models that predict electronic couplings between protein residues in seconds instead of expensive QM calculations; trained on 270,000+ Q-Chem calculations (38 residue-pair types), with median cross-validated sMAPE of 10% across residue-pair types and ~99% sign accuracy.
- Combined these models with physics-based energy calculations (Marcus theory) in a development version of the lab's eMap software, so it can quickly calculate protein electron-transfer.
- Built an automated screening pipeline (sequence clustering, genome-neighborhood filtering, AlphaFold 3 modeling, electron-transfer analysis) that narrowed 18,000+ bCcP-superfamily sequences to 11 candidate MauG-like enzymes for experimental characterization by the Elliott group.
- Lead theoretical modeling in an ongoing Galagan Lab collaboration to improve a high-precision wearable electrochemical sweat cortisol sensor.

Vajda Lab - Boston University — Boston, MA
Computational Chemistry Researcher - ML-Guided Docking — *September 2024 - March 2025*

- Acquired, cleaned and standardized the protein-ligand structure datasets used to train and test a graph-neural-network docking method.
- Wrote Python benchmarking scripts that scored more than 3,500 predicted docking models against reference structures to measure accuracy.
- Built automated structural-QC checks flagging steric clashes and geometric inconsistencies in predicted complexes to diagnose model failures.

Dries Lab - Boston University Chobanian & Avedisian School of Medicine — Boston, MA
Computational Biology Researcher - Scientific Software — *September 2024 - May 2026*

- Lead author of dbVisuals (open-source, in CRAN review) and author/maintainer of companion packages rDeckgl and rMosaic (CRAN): database-backed, GPU-accelerated interactive visualization, drawing 20 million synthetic points in 2.5 s on a laptop (static ggplot2: 28 s).
- Co-developed dbverse, a database-backed framework that runs larger-than-memory analysis of millions of cells on ordinary computers, orders of magnitude faster than in-memory and file-backed methods.

Prior Research: Foster Research Group, September 2023 - May 2024 (Cancer-Targeting Nanoparticle Synthesis); CADD Research Group, June 2022 - May 2024 (Computational Chemistry, Data Analysis and Dataset Preparation).

Engineering & Leadership

MacroGlide — Boston, MA
Co-Founder & Chief Technology Officer (CTO) — *June 2024 - Present*

- Created the company's project-management system and have led a team of 5+ people for over 1.5 years.
- Developed automated AI content pipelines for social media: the main Instagram account grew to 450,000+ followers; now runs 50+ accounts.
- Developed an automated newsletter platform (multi-source data acquisition, agentic news selection and writing with automated quality scoring, email delivery infrastructure); 5,000+ new subscribers monthly.
- Automated internal engineering and project-management processes, roughly tripling the team's engineering output.

Publications & Manuscripts

- E. C. Ruiz, V. Jarzabek, J. Chen, **T. Rizvanov**, I. Amin, R. Dries. "dbverse scales spatial omics analysis with embedded analytical databases." *bioRxiv*, 2026. DOI: 10.64898/2026.08.09.743742
- A. J. Kranc, **T. Rizvanov**, S. J. Elliott, K. B. Bravaya. "Unearthing Family Secrets: Searching for Shared Electron Transfer Pathways in the bCcP Superfamily." Submitted, 2026; presented at ACS Fall 2026 (COMP).
- **T. Rizvanov**, E. C. Ruiz, R. Dries. "dbVisuals: interactive, database-backed visualization of spatial omics data in R." In preparation, 2026.
- **T. Rizvanov**, K. B. Bravaya. Deep-learning prediction of electronic couplings for protein electron transfer. Manuscript in preparation, 2026.

Technical Skills

Machine Learning: Python, PyTorch, Deep Learning (ANN, GNN), Dataset Curation and Preparation, Model Benchmarking, LLM Agents.
Computational Chemistry: Q-Chem, DFT, Molecular Dynamics, Marcus Theory, Statistical Thermodynamics, AlphaFold 3, Docking.
Scientific Computing & HPC: C/C++, CUDA, GPU Optimization, Linux, HPC Cluster Computing (SGE), Git.
Data & Software Engineering: SQL, PostgreSQL, DuckDB, Apache Arrow, Parquet, R (CRAN Packages), TypeScript, CI/CD.
Laboratory Chemistry: Organic Synthesis, Retrosynthesis, Nanoparticle Synthesis, NMR, IR, HPLC, LC-MS, Column Chromatography.

Awards

- Outstanding Research Award, ACS Fall 2026 National Meeting, Division of Computers in Chemistry (COMP).
- Winner, ClawBio Hackathons: Agentic Genomics, 2026; Second Place, HackHarvard Healthcare Track, 2026.
- Three-time winner, National Stage of Chemistry Olympiad, 2021-2023; International Chemistry Olympiad (IChO) Qualifier participant, 2023.