Uladzimir Charniauski

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Education

University of Connecticut   *Aug 2022 – Dec 2025*
BA in Applied Mathematics, BA in Statistics, Minors in CS & Economics

- **GPA:** 3.83/4.0
- **Relevant coursework & topics:**
  - **Statistical Theory & Methods:** Probability Theory, Time Series Analysis, Statistical Computing (R), Econometrics, Stochastic Processes, Linear Models
  - **Machine Learning:** Reinforcement Learning, Deep Learning, Bayesian Machine Learning, Machine Learning for Physical Sciences (SciML), Artificial Intelligence - Time Series Foundation Models (TSFMs)
  - **Mathematics:** Linear Algebra, Calculus III, Real Analysis, Numerical Analysis (MATLAB).

Research Projects

Time Series RAG X (TS-RAGX)   *May 2025 - Present*

- Extending the **TS-RAG** augmentation module by introducing the retrieved historical contexts to improve zero-shot performance of TSFMs
- Conducting extensive experimental evaluations of **Chronos-Bolt** TSFM baseline, benchmarking predictive accuracy, runtime performance, and scalability on large-scale temporal datasets
- Developed automated workflows to streamline hyperparameter tuning and model evaluation processes, accelerating experimentation cycles and improving reproducibility

Memory-Augmented Variational RNN (MVRNN) | GitHub ↗   *Sep 2025 - Dec 2025*

- Developed a novel **Memory-Augmented Variational RNN (MVRNN)** architecture that incorporates **variational** and **Wasserstein autoencoders (VAE and WAE)** within memory-augmented RNNs (MRNNs), enabling the modeling of latent temporal dependencies and lon memory in sequential data
- Derived the evidence lower bounds (ELBO) necessary for sequential variational inference in MRNN frameworks augmented with VAE and WAE components
- Demonstrated a 7–10% improvement in **RMSE** and **MAE** scores over baseline models using a memory-augmented variational network on several real-world stock-volatility datasets.

Filter Bank-Embedded MRNN and MLSTM | GitHub ↗   *Feb 2025 - Apr 2025*

- Developed **Filter Bank-Embedded Memory-Augmented RNN (F-MRNN)** and **LSTM (F-MLSTM)** architectures that integrate a collection of long memory filters to capture diverse frequency components in temporal data
- Demonstrated that **F-MRNN** and **F-MLSTM** frameworks improve the approximation of fractional integration effects through their multi-filter architectures
- Empirically demonstrated 5–7% improvement in RMSE and MAE scores using filter-banked memory-augmented networks on real-world time series data with long-range dependence.

Publications

Long-Memory AutoRegressive Bandits.   *Present*
Uladzimir Charniauski, Yao Zheng
Manuscript in preparation. Draft available upon request

On the Anomaly Detection in Time Series Data with Kernel PCA   *April 2025*
Uladzimir Charniauski
Journal of UConn STAT Student Seminars

Autoregressive Bandits in Near-Unstable or Unstable Environment. Sep 2024

Uladzimir Charniauski, Yao Zheng

American Journal of Undergraduate Research

Working Experience

NSF REF Undergraduate Researcher *Storrs, CT*
University of Connecticut *Sep 2025 – Present*

- Led the development and implementation of specialized **Retrieval-Augmented Generative (RAG) systems** for enhancing the forecasting performance of TSFMs through bringing architectural innovations to latest architectures.
- Processed, cleaned, and engineered features from large-scale time series datasets, leveraging statistical methods and domain-specific transformations to improve model robustness.
- Collaborated with faculty and graduate researchers to document findings, visualize results, and prepare materials for manuscript writings and conference presentations

ML Engineering Intern - AI Platform *Hartford, CT*
The Hartford *May 2025 – Aug 2025*

- Built a **Streamlit**-based tool integrating **AWS Bedrock LLMs** to generate automated PowerPoint decks from enterprise chatbot output (HartAI), reducing manual effort by 80%.
- Managed end-to-end model deployment workflows using **MLflow**, including experiment tracking, model versioning, and production deployment to ensure reliable and scalable AI solutions
- Leveraged **Git** for robust version control, code reviews, and collaborative development within a cross-functional engineering team

Statistical Analyst Intern *Boston, MA*
Valos *Jun 2024 – Aug 2024*

- Conducted statistical analysis and data manipulation using **R (Tidyverse)** to support business intelligence and decision-making initiatives.
- Performed exploratory data analysis, statistical modeling, and data visualization to identify patterns and generate actionable insights
- Created and maintained comprehensive documentation of data sources, workflows, and code to ensure full reproducibility and transparency

Skills and Technologies

Languages & Libraries: Python, R, MATLAB, SAS, SQL; Tidyverse, NumPy, Pandas, Scikit-learn, PyTorch, TensorFlow, Matplotlib, Tikzplotlib; Streamlit, python-pptx, LlamaIndex

Technologies: Git, GitHub, AWS Cloud Services, Snowflake, MLflow, Jupyter Notebooks

Frameworks & Techniques: LangChain, ReAct AI Agents, Statistical Modeling & Forecasting, Machine Learning, Data Visualization, Data Engineering, Prompt Engineering, Model Deployment, Time Series Analysis

Awards and Honors

- **National Honorary Mathematics Society, Pi Mu Epsilon**, University of Connecticut
- **2023 & 2024 New England Scholar**, University of Connecticut
- **Spring 2024 & Fall 2024 Dean's List**, University of Connecticut