

# Uladzimir Charniauski

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## Education

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### 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:** Bayesian Machine Learning, Time Series Analysis, Statistical Computing (R), Probability Theory
  - **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

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### Time Series RAG X (TS-RAGX)

May 2025 - Present

- Extending the **TS-RAG** framework by augmenting each retrieved component with localized context windows for each retrieved component to improve zero-shot forecasting performance in transformer-based time series forecasting models (TSFMs)
- Conducting extensive experimental evaluations of **Chronos-Bolt** and **ToTo** TSFMs, benchmarking their 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

- Designed novel architecture combining variational and Wasserstein autoencoders with memory-augmented RNNs to model latent temporal dependencies in high-variability sequential data
- Derived evidence lower bound (ELBO) for sequential variational inference with external memory structures
- Demonstrated **7-10%** outperformance of a memory-augmented variational networks in terms of **RMSE** and **MAE** metrics 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)**, integrating custom-designed filter banks to capture diverse frequency components in temporal data
- Demonstrated that **MRNN** and **MLSTM** frameworks benefit from multi-filter architecture in approximating fractional differencing
- Empirically demonstrated the **5-7%** outperformance of filter-banked memory-augmented networks on real-world Time Series data with persistent long-range dependencies in terms of **RMSE** and **MAE** metrics

## Publications

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### Long-Memory AutoRegressive Bandits.

In Progress

Uladzimir Charniauski, Yao Zheng

Target Journal: NeurIPS

### On the Anomaly Detection in Time Series Data with Kernel PCA

April 2025

Uladzimir Charniauski

UConn Journal of UConn STAT Student Seminars

### Autoregressive Bandits in Near-Unstable or Unstable Environment.

Sep 2024

Uladzimir Charniauski, Yao Zheng

## Working Experience

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### NSF REF Undergraduate Researcher

University of Connecticut

Storrs, CT

Sep 2025 – Present

- Led the development and implementation of specialized 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

The Hartford

Hartford, CT

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

Valos

Boston, MA

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

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**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:** LangChains, ReAct AI Agents, Statistical Modeling and Forecasting, Machine Learning, Data Visualization, Data Engineering, Prompt Engineering

## Awards and Honors

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- **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