Shicheng PENG

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Education

University of Michigan **Aug. 2024 – Present**
Master's in Applied Statistics & Robotics | GPA: 4.0/4.0 *Ann Arbor, MI, USA*

The Chinese University of Hong Kong **Sept. 2020 – May 2024**
Bachelor's in Financial Engineering | GPA: 3.8/4.0 (Top 10%) *Shenzhen, China*

Selected Coursework: Regression Analysis (PhD level), Machine Learning, Probability Distribution Theory, Statistical Theory, Bayesian Modeling, Ordinary Differential Equations, Stochastic Processes, Stochastic Simulation, Numerical Methods, Data Structures (Algorithms), Discrete Mathematics

Technical Skills

Programming: Python, C++, R, MATLAB, MySQL, Linux, Bash
Libraries/Tools: PyTorch, TensorFlow–Keras, scikit-learn, NumPy, Pandas, LaTeX, Git, Docker
Data/ML: Machine Learning, Deep Learning, Time Series Analysis, Reinforcement Learning

Publications

Peng, S. (2023). *Modeling the pork price cycle in China based on the age structure of hogs.* Frontiers in Artificial Intelligence and Applications, 373, 995–1005. https://doi.org/10.3233/faia230912. (Indexed in EI Compendex)

Honors & Awards

- **Tier 1 Academic Performance Scholarship**, CUHK-Shenzhen - Top 1 in school 2022–2023
- **Dean's List**, CUHK-Shenzhen - Awarded 3 times for outstanding academic performance 2020–2023
- **Programming Contest**, CUHK-Shenzhen - Third Prize (Top 50 / 450 participants) 2024

Academic & Project Experience

Cross-modal Video Summarization with Vision LLMs **Mar-May. 2025**
Leader & Core Contributor [Report] *University of Michigan*

- Led a team of 3 in advancing an end-to-end cross-modal summarization project, bridging the gap between text-only vs video-only pipelines.
- Designed a masked local self-attention window, enhancing fine-grained motion capture and temporal coherence.
- Improved frame-level saliency prediction and alignment with human annotations: **Spearman's ρ +14%**, **CIDEr +2.3**, **METEOR +0.7**.
- Built end-to-end PyTorch training pipelines and managed GPU experiments (NVIDIA RTX 4060) on the *VideoXum* dataset (14K+ annotated videos).

An Efficient Modified Computation for SVD Decomposition **Oct-Dec. 2023**
Code Contributor *CUHK-Shenzhen*

- Implemented two-phase SVD via Golub–Kahan bidiagonalization with QR methods (Wilkinson shift & deflation, Cholesky iteration) using basic `numpy`.
- Built a power iteration singular values computation algorithm to accelerate computation; provided a rigorous proof of equivalence between QR variants mentioned above.
- Applied algorithms to image deblurring and to frame-level background extraction on 1fps videos.

Modeling China's Pork Price Cycle via Hog Age Structure **Oct-Dec. 2022**
Sole Researcher & Author *CUHK-Shenzhen*

- Developed a dynamic differential process model for pig production and consumption; simulated the production adjustment through an optimization problem.
- Validated by reproducing historical pork price trends (2007–2034), correctly predicting the downward trend from 2022 onward.
- Implemented all models and simulations fully in Python.