Jeongik Cho

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Summary

PhD candidate in deep learning, specializing in generative models, representation learning, computer vision, and unsupervised deep learning algorithms. Proficient in building machine learning systems using PyTorch and TensorFlow. Applied these methods to practical problems in controllable data generation, anomaly detection, clustering, classification, and regression.

Education

Concordia University, Montreal, Canada
PhD in Computer Science and Software Engineering — Sep 2020 – Jul 8, 2025 (Expected)

Konkuk University, Seoul, South Korea
BSc in Computer Science and Engineering — Mar 2016 – Mar 2020

Publications

PhD thesis includes latest experiments of publications [pdf]

1. **Cho, J**. and Krzyzak, A., "Training Self-supervised Class-conditional GANs with Classifier Gradient Penalty and Dynamic Prior," under review. [preprint part 1] [preprint part 2] [short pdf] [code]
   - We propose an algorithm to train a self-supervised class-conditional GAN using a classifier gradient penalty and a dynamic prior. This approach enables the model to represent data as a combination of continuous and discrete latent factors, which can be used for unsupervised clustering and classification tasks. **#Clustering #Classification #RepresentationLearning #GenerativeModel #ComputerVision**
2. **Cho, J**. and Krzyzak, A., "Efficient integration of perceptual Variational Autoencoder into Dynamic Latent Scale Generative Adversarial Network," Expert Systems, 2024. [paper link] [short pdf] [code]
   - We efficiently integrated a GAN with a perceptual VAE, demonstrating improved generative performance and enhanced inversion accuracy of the generative model. **#Representation Learning #GenerativeModel #ComputerVision**
3. **Cho, J**. and Krzyzak, A., "Self-supervised Out-of-distribution Detection with Dynamic Latent Scale GAN," S+SSPR, 2022. [paper link] [short pdf] [code]
   - We applied generative model inversion to map data into latent space and performed anomaly detection (out-of-distribution detection) using the log-likelihood scores of the inferred latent vectors. **#AnomalyDetection #GenerativeModel #ComputerVision**
4. **Cho, J**. and Krzyzak, A., "Dynamic Latent Scale for GAN Inversion," in ICPRAM, 2022. [paper link] [short pdf] [code]
   - We proposed dynamically scaling the latent distribution to enhance the performance of GAN inversion and stabilize convergence. **#Representation Learning #GenerativeModel #ComputerVision**
5. **Cho, J**. and Yoon, K. "Conditional Activation GAN: Improved Auxiliary Classifier GAN," IEEE Access, 2020. [paper link] [code]
   - We proposed an algorithm that improves the performance of class-conditional GANs by leveraging multiple GAN loss functions while reducing the number of required hyperparameters. In addition, we introduced a method that ensures real and generated samples within each batch follow the same class distribution, enabling stable class-conditional generation even under class imbalance. **#Classification #GenerativeModel #ComputerVision**
6. Braun, A., Kohler, M., **Cho, J**., and Krzyzak, A., "Analysis of the rate of convergence of two regression estimates defined by neural features," Electron. J. Stat., 2024. [paper link]
   - We proposed regression models training only output layers via regularized least squares, achieving theoretical convergence rates without backpropagation. **#NeuralNetwork #Regression**
7. Kohler, M., **Cho, J**., and Krzyzak, A., "On the rate of convergence of an over-parametrized deep neural network regression estimate with ReLU activation function learned by gradient descent," under review.
   - We proved that over-parameterized ReLU networks trained by gradient descent achieve dimension-free convergence under interaction model assumptions. **#NeuralNetwork #Regression**

Experiences

PhD Researcher, Concordia University, Montreal, Canada — Sep 2020 – Present
- Developed deep learning algorithms for generative models and representation learning.
- Applied methods to tasks such as unsupervised clustering, anomaly detection, and data manipulation, demonstrating the practical value of academic research.

Teaching Assistant, Concordia University, Montreal, Canada — Jan 2022 – Dec 2024
- Assisted in undergraduate courses by leading tutorial lectures and grading assignments, projects, and exams.

QA Game Tester, Altagram, Montreal, Canada — May 2023 – May 2024

Technical Skills

Languages: Python, TensorFlow, PyTorch, Scikit-learn, Pandas, SQL
Concepts: Generative Models, GANs, Diffusion Models, Anomaly Detection, Clustering, Representation Learning, Unsupervised Learning, Regression, Computer Vision, Pattern Recognition, LLM

Languages

Korean (native), English (proficient), Japanese (proficient, JLPT N1)