HU MINGHUI

Nanyang Technological University, Singapore
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EDUCATION

School of EEE, Nanyang Technological University **Aug, 2020 - Est. Aug, 2023.**
*Ph.D Candidate - **CGPA - 4.5(5)*** *Singapore*

School of EEE, Nanyang Technological University **Jul, 2018 - Jun, 2019**
*MSc. - Computer Control Automation - **CGPA - 4.3(5)*** *Singapore*

School of EE, Dalian Maritime University **Sep, 2014 - Jul, 2018**
*BEng. - Electrical and Elctronic Engineering - **CGPA - 4.14(5)*** *Dalian, China*

RESEARCH INTEREST

- Generative models, including Diffusion/ Score Matching / Variational Inference;
- Multi-modal Tasks, including Generation and Manipulation;
- Limited touch on 3D scene completion and generation, e.g. Neural Radiance Fields, but would keep an eye on;

INTERNSHIP

Researcher, MiniMax **Mar 2023 - Sept 2023**
Remote / Shanghai, China

- Algorithm development.
- Research Area: **Scale up Text-to-Image Model and Improve the Controllability.**

Research Scientist, Altered State Machine **Oct 2022 - Mar 2023**
Remote / Auckland, New Zealand

- Algorithm development.
- Research Area: **Diffusion Model and Large Scale Model for Melody and Acoustic Generation.**

Research Intern, JD Explore Academy **Apr 2022 - Oct 2022**
Remote / Beijing, China

- Algorithm development.
- Research Area: **Diffusion Model and Large Scale Model for Multimodal Generation.**

Research Intern, SenseTime Research **Feb 2021 - Jul 2021**
Beijing, China

- Algorithm development and maintenance.
- Vector Quantised model for fast image classification and generation.
- Research Area: **Vector Quantised Approach for Image Classification and Synthesis**.

RESEARCH PROJECTS

Project Rendezvous **Jul, 2021 - Dec, 2022**

- Cooperation with DSO National Laboratories.
- Investigate the use of ADS-B signals for aircraft classification.
- Develop ATC classification model based on Self-supervised and Contrastive learning, inspired by **Wav2Vec**.
- Help to develop codes to receive, demodulate and decode/encode transponder digital communication signals.

A.I. Enabled Matched Filter-like Communications Signal Reception. **Jul, 2019 - Jun, 2021**

- Cooperation with Temasek Laboratories@NTU.
- Developed algorithms for demodulating the detected array signals under co-channel and HF-like channel conditions with comparable performance to a matched filter.
- Developed models for optimally estimating signal parameters include frequency offset and Baud rate for the simulation data and the real HF data (2G-ALE).

PUBLICATIONS

MY GOOGLE SCHOLAR

Journals

Hu, M., Gao, R.& Suganthan, P. N., *Self-Distillation for Randomized Neural Networks* **IEEE Trans. on Neural Networks and Learning Systems**

Zheng, J., Liu, D., **Hu, M.**, Wang, C., Ding, C.& Tao, D., *MMoT: Mixture-of-Modality-Tokens Transformer for Composed Multimodal Conditional Image Synthesis.* **IJCV in Submission**

Chen, J., Wang, H., **Hu, M.** & Suganthan, P. N., *Versatile LiDAR-Inertial Odometry with SE(2) Constraints for Ground Vehicles.* **IEEE Robotics and Automation Letters**

Hu, M., Chion, Jet., Suganthan, P. N. & Katuwal, R., *Ensemble Deep Random Vector Functional Link Neural Network for Regression.* **IEEE Trans. on Systems, Man and Cybernetics: Systems**

Hu, M., Suganthan, P. N., Gao, R. & Tanveer, M. *Automated Layer-wise Solution for Ensemble Deep Randomized Feed-forward Neural Network.* **Neurocomputing**

Hu, M. & Suganthan, P. N., *Representation Learning Using Deep Random Vector Functional Link Networks for Clustering.* **Pattern Recognition**

Hu, M. & Suganthan, P. N., *Experimental evaluation of stochastic configuration networks: Is SC algorithm inferior to hyper-parameter optimization method?* **Applied Soft Computing**

Shi, Q., **Hu, M.**, Suganthan, P. N., & Katuwal, R., *Weighting and Pruning based Ensemble Deep Random Vector Functional Link Network for Tabular Data Classification.* **Pattern Recognition**

Ganaie, M.A., **Hu, M.** & Suganthan, P. N, *Ensemble deep learning: A review.* **Engineering Applications of Artificial Intelligence**

Gao, R., Li, R., **Hu, M.**, Suganthan, P. N.& Yuen, K.F., *Dynamic ensemble deep echo state network for significant wave height forecasting* **Applied Energy**

Gao, R., Li, R., **Hu, M.**, Suganthan, P. N.& Yuen, K.F., *Significant wave height forecasting using ensemble deep randomized networks with neurons pruning* **Engineering Applications of Artificial Intelligence**

Conference

Hu, M., Zheng, J., Liu, D., Zheng, C., Wang, C., Tao, D., & Cham, T.J. *Cocktail: Mixing Multi-Modality Controls for Text-Conditional Image Generation.* **NeurIPS'23**

Chen, J., Wang, H., **Hu, M.** & Suganthan, P. N., *Versatile LiDAR-Inertial Odometry with SE(2) Constraints for Ground Vehicles.* **IROS'23**

Hu, M., Zheng, C., Zheng, H., Cham, T., Wang, C., Yang, Z., Tao, D., & Suganthan, P.N. *Unified Discrete Diffusion for Simultaneous Vision-Language Generation.* **ICLR'23**

Hu, M., Wang, Y., Cham, T.J., Yang, J., & Suganthan, P.N., *Global Context with Discrete Diffusion in Vector Quantised Modelling for Image Generation.* **CVPR'22**

Qiao, Z., **Hu, M.**, Jiang, X., Suganthan, P. N.& Savitha, R. *Class-incremental learning on multivariate time series via shape-aligned temporal distillation.* **ICASSP'23**

Hu, M., Gao, R., & Suganthan, P. N., *Reservoir Computing Based Randomly Connected Networks for Non-sequential Tasks.* **IJCNN'22**

Hu, M., Shi, Q., Suganthan, P. N., & Tanveer, M., *Adaptive Ensemble Variants of Random Vector Functional Link Networks.* **ICONIP'20**

Academic Service

Journal Reviewer

Applied Soft Computing

Pattern Recognition

Neurocomputing

Engineering Applications of Artificial Intelligence

IEEE Trans. on Systems, Man and Cybernetics: Systems

IEEE Trans. on Neural Network and Learning Systems

Conference Program Committee Member

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR '22 '23)

International Conference on Computer Vision (ICCV '23)

International Joint Conference on Neural Networks (IJCNN '20 '21 '22 '23)

International Conference on Neural Information Processing

IEEE Symposium Series on Computational Intelligence