HU MINGHUI

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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) - 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;

RESEARCH PROJECTS

Project Rendezvous **Jul, 2021 - Pres.**

- 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).

INTERNSHIP

Research Intern, Altered State Machine **Pres.**
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.**
- ICLR submission: Unified Discrete Diffusion for Simultaneous Vision-Language Generation.
- CVPR submission: Mixture-of-Modality-Tokens Transformer for Multimodal Conditional Image Synthesis.

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**.

PUBLICATIONS

MY GOOGLE SCHOLAR

Journals

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

Hu, M., Xu, S., Yuan, F., Razul, S., Noise Hits Target: Exploring the versatility of Pre-training Model for Air Traffic Control Signal based Aircraft Type Classification. **ICASSP'23 in Submission**

Zheng, J., Liu, D., **Hu, M.**, Wang, C., Ding, C.& Tao, D., MMoT: Mixture-of-Modality-Tokens Transformer for Composed Multimodal Conditional Image Synthesis. **CVPR'23 in Submission**

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**

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

IEEE Trans. on Systems, Man and Cybernetics: Systems

IEEE Trans. on Neural Network and Learning Systems