# Efficient and Accurate Spatial-Temporal Denoising Network for Low-dose CT Scans

Leihao Wei<sup>12</sup>, William Hsu<sup>2</sup> 1. Electrical and Computer Engineering, 2. Medical & Imaging Informatics Group

3x3x3 conv

Objective: Utilize a deep neural network to enhance CT scans that were acquired at lower dose, thick slice-thickness (LR) to have the same appearance as the ones acquired at a normal condition (HR).





### Improve Computational Efficiency



## **Results**









### **Radiomic Features**

1.65



Red/Green indicates significant/non-significant difference to baseline via



# Conclusions

- Spatial-temporal convolution is effective in reducing the training and inference time of improving CT image quality.
- Although CT images have 12-bit gray-levels, using 12-bit for weights is not ● necessary during inference. 8-bit quantization is yet accurate. Up to 7.11X speed-up was achieved compared to SRResNet while maintaining similar accuracy.
- Evaluate the impact of 8-bit quantization to downstream tasks such as lung ulletnodule detection.

