Weekly Report

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1 Progress

- Apply wavelet reconstruction after applying EMD
- Check accuracy with different IMFs to be selected in noisy dataset under close-set condition

2 Results

Table 1: Accuracy when using EMD + Wavelet reconstruction

IMF4, 5, 6	32.48%
IMF5, 6	34.26%
IMF6	34.31%

The accuracy improves by 2.7 2.8% when not using IMF4. I think this is because IMF4 contains more high-frequency components and noise than the heart rate signal compared to IMF5 and 6.

Table 2: Comparison of EMD vs EMD + Wavelet

Only EMD	29.83%
EMD + Wavelet rec	32.48%

Since the accuracy when only BPF is applied is 47.27%, it is possible that EMD has a bad influence.

Also, compared to the case where only EMD is applied, the wavelet transform increases the accuracy by 2.6%, suggesting that the wavelet transform may contribute to the improvement of accuracy to some extent.

3 Next Plan

- Try Another preprocessing method

– BPF + Wavelet reconstruction
– Using I/Q data and applying ellipse fitting (now just using I data)
– Adding threshold processing to wavelet coefficients
– Changing the decomposition level of wavelet transform (It affects the rate of denoising.)