



中科院计算所

# Robust Remote Heart Rate Estimation from Face Utilizing Spatial-temporal Attention

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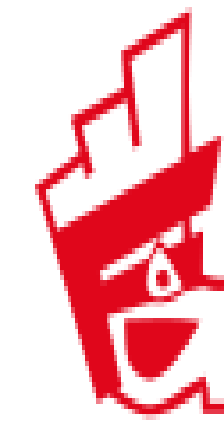
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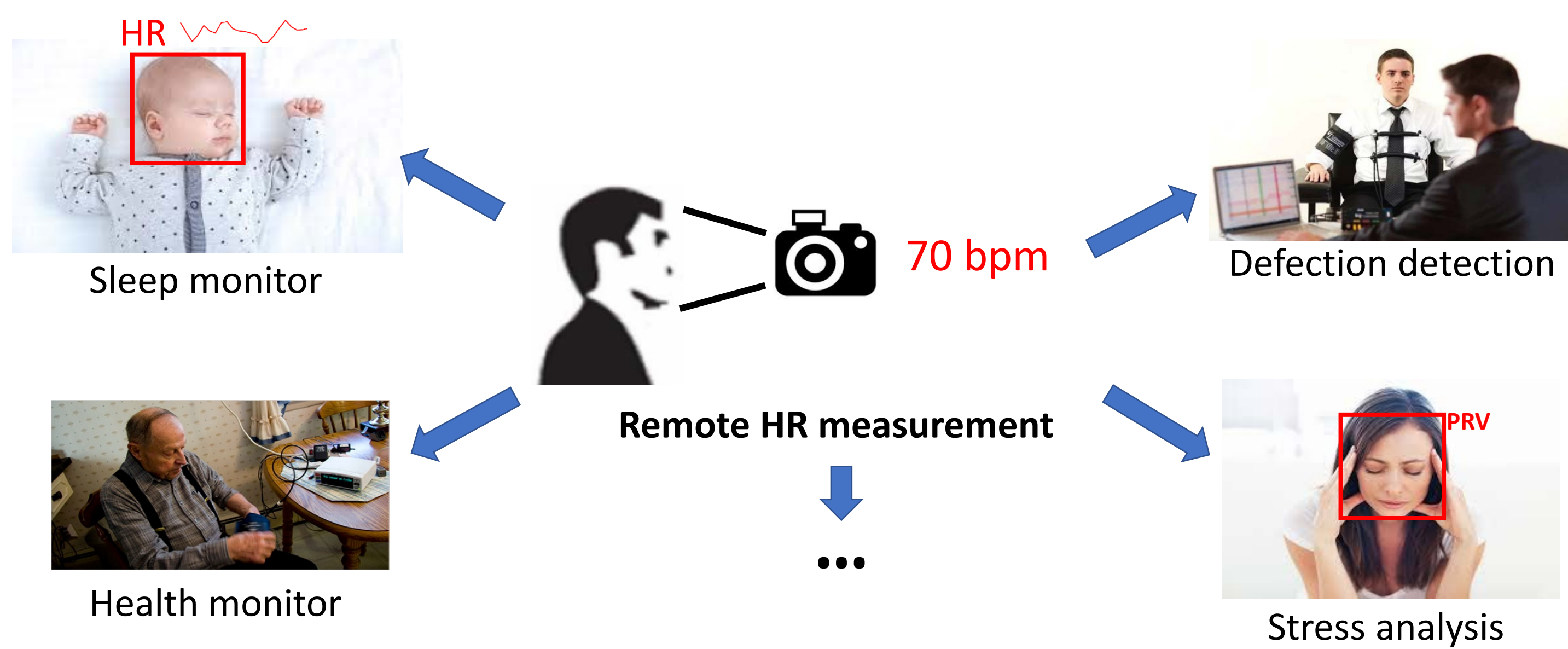
Paper #: 236

## Problem

### ➤ Remote heart rate estimation from face video

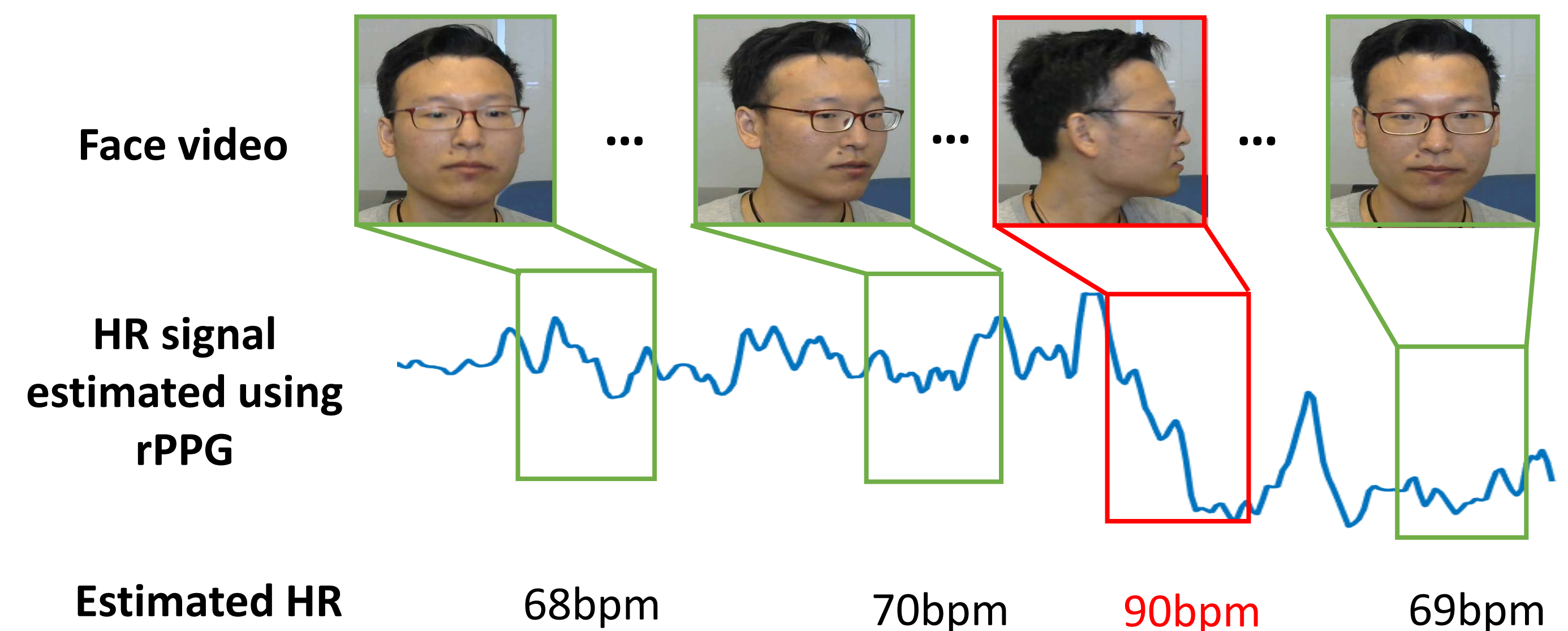


### ➤ Various applications of remote heart rate estimation

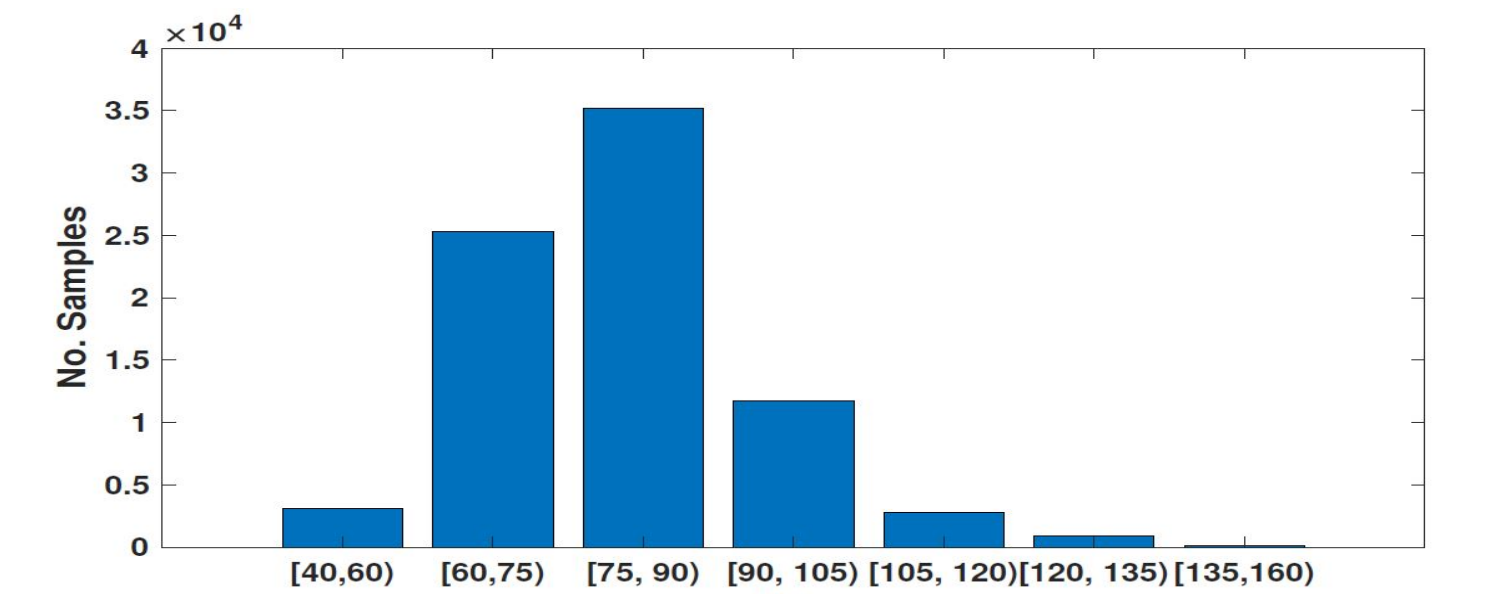


## Motivation

### ➤ Existing learning based methods failed to remove the polluted HR signals, and an attention mechanism can be helpful for filtering the salient features in HR signals.



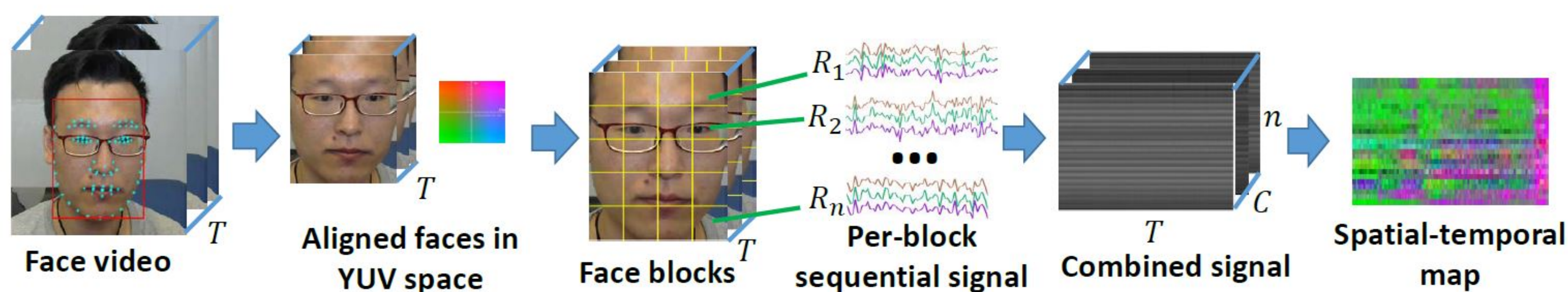
### ➤ The HR databases are limited in size, and suffer from the problem of data imbalance in term of different HRs.



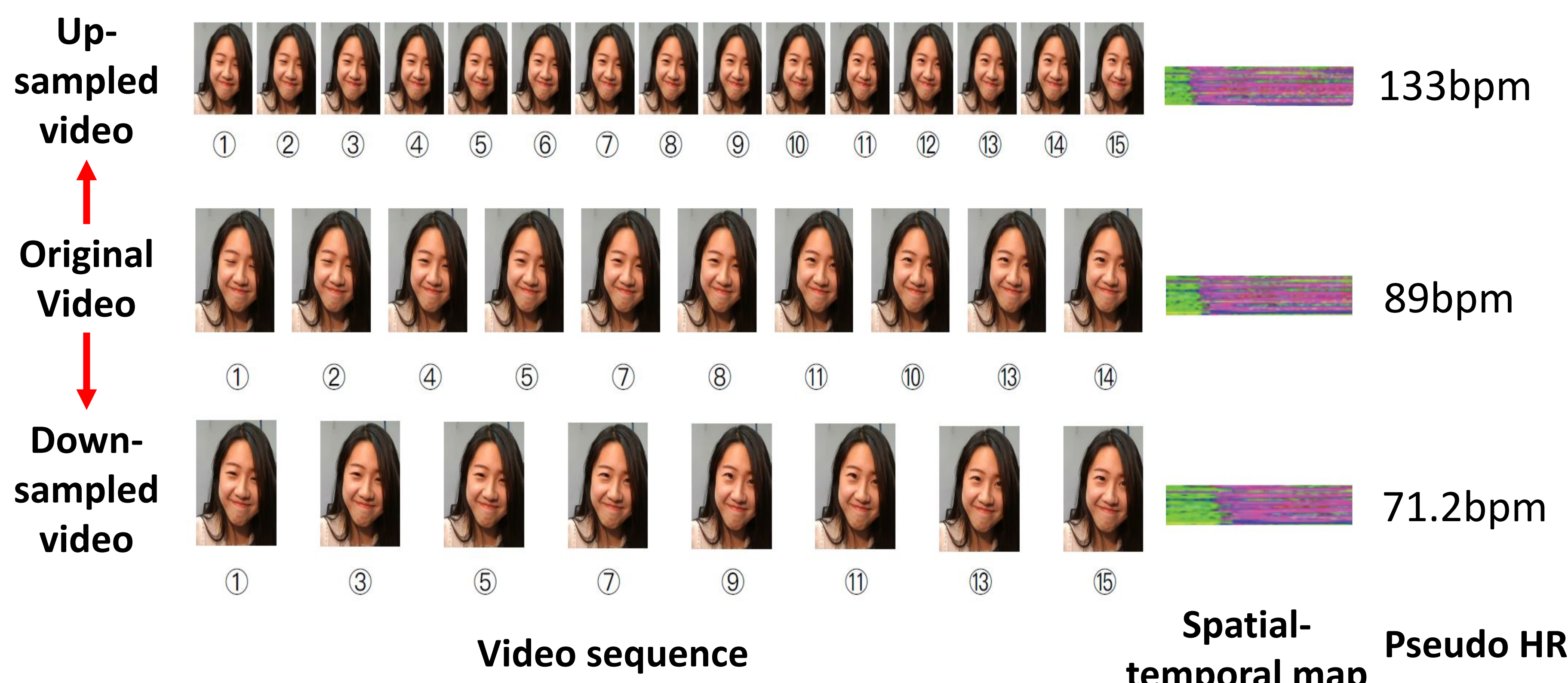
The ground-truth HR distribution of VIPL-HR

## Proposed Method

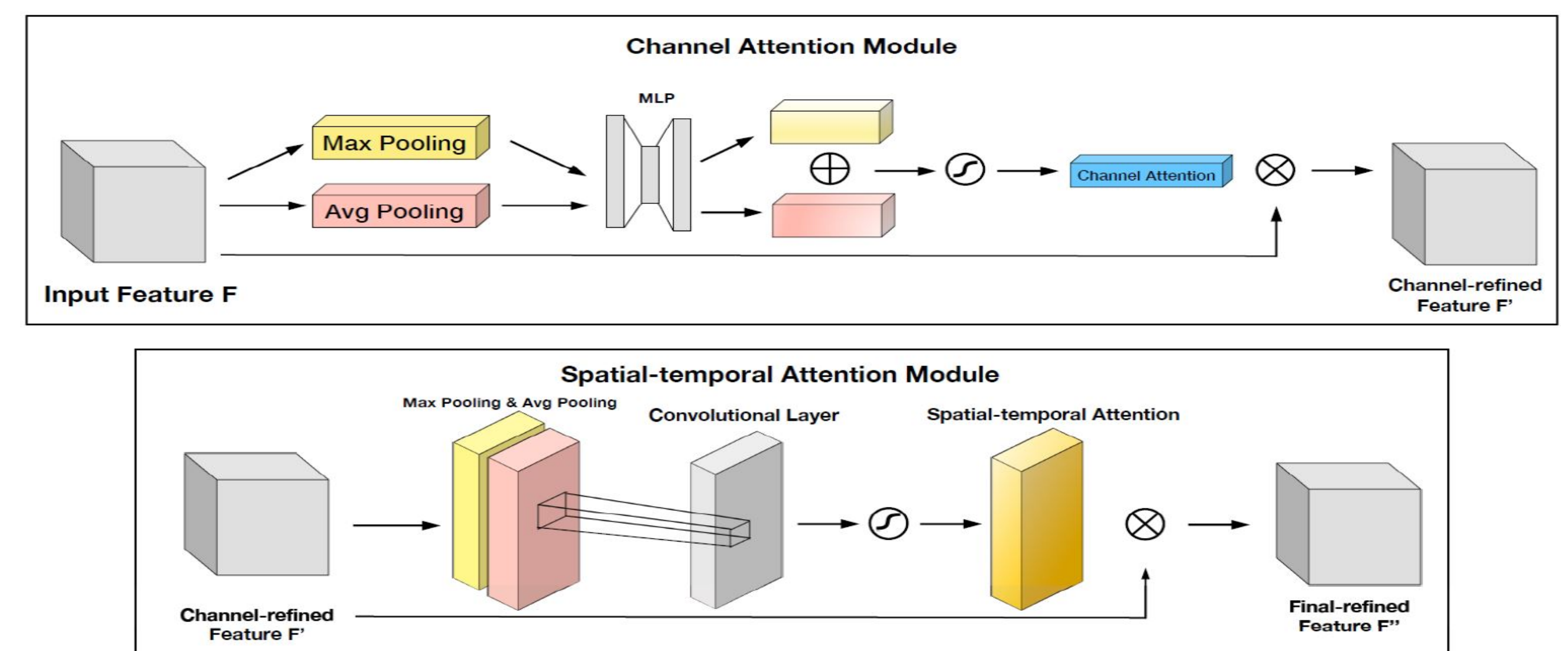
### ➤ Spatial-temporal map generation procedure



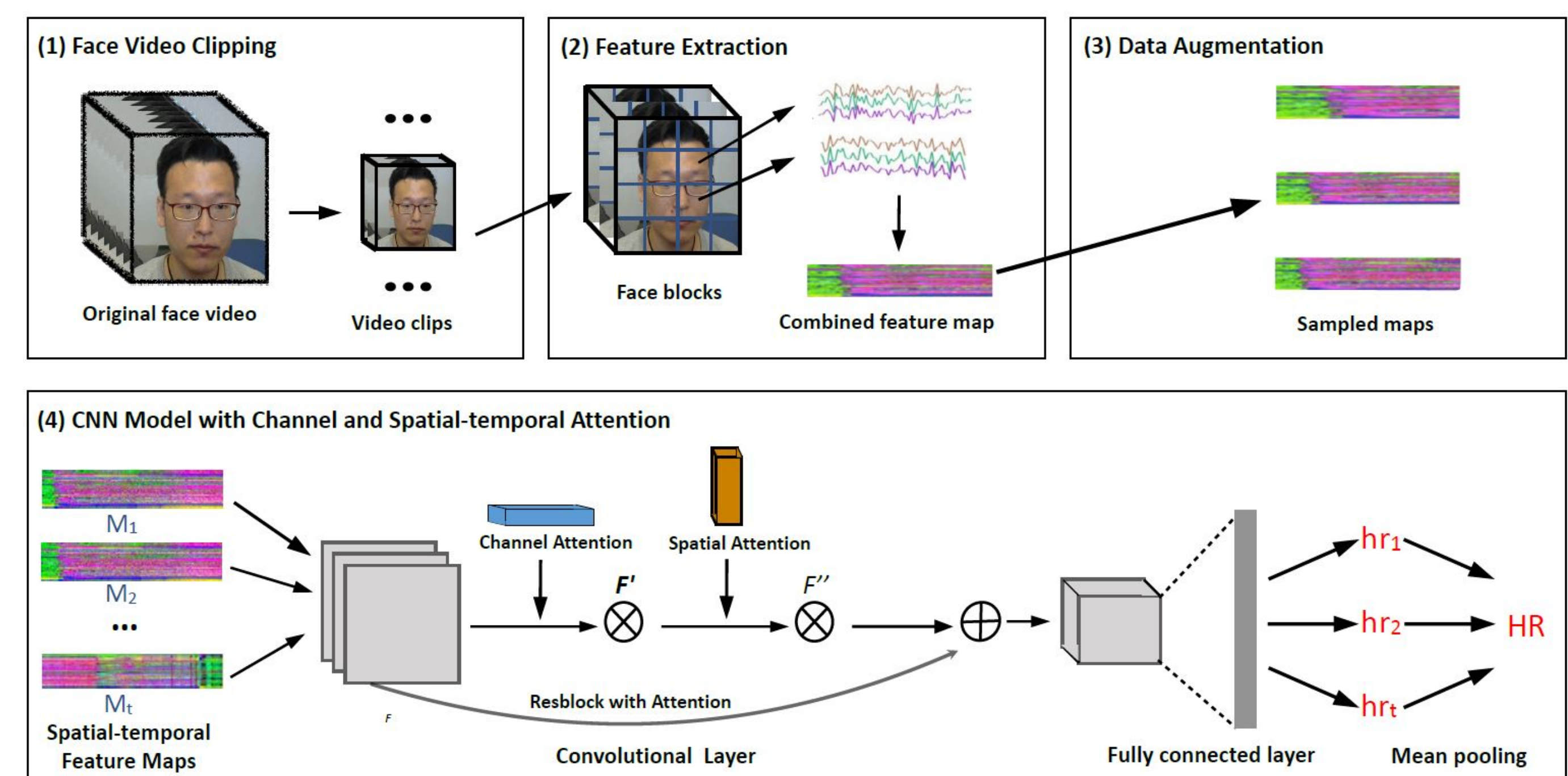
### ➤ Data augmentation (DA)



### ➤ Attention machinem



### ➤ End-to-end HR estimation



## Results

### ➤ Databases

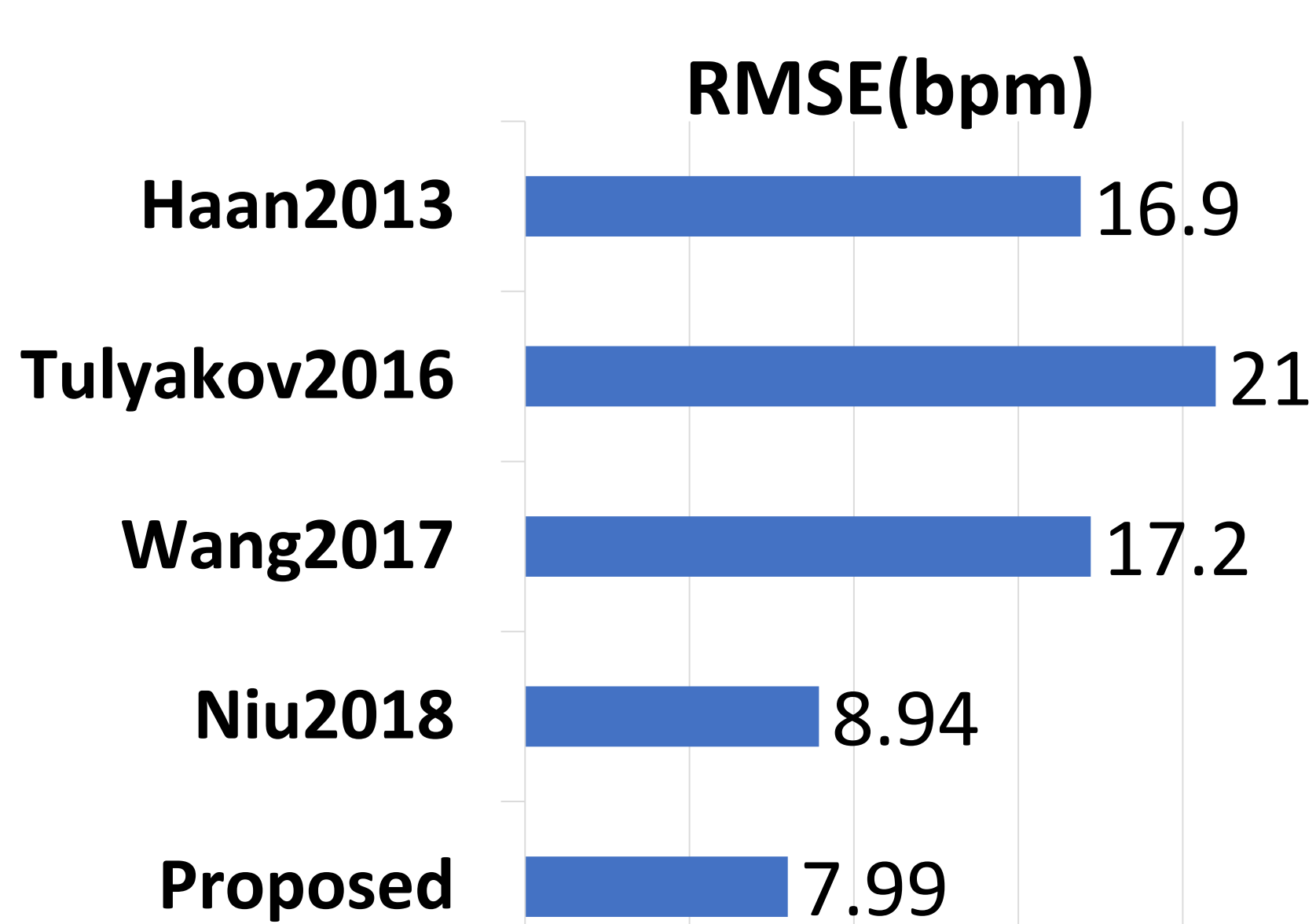
Database	No. Subj.	No. Vids.	Video length	protocol
VIPL-HR	107	2,378	30s	within-database
MMSE-HR	40	102	30s	cross-database

Download VIPL-HR

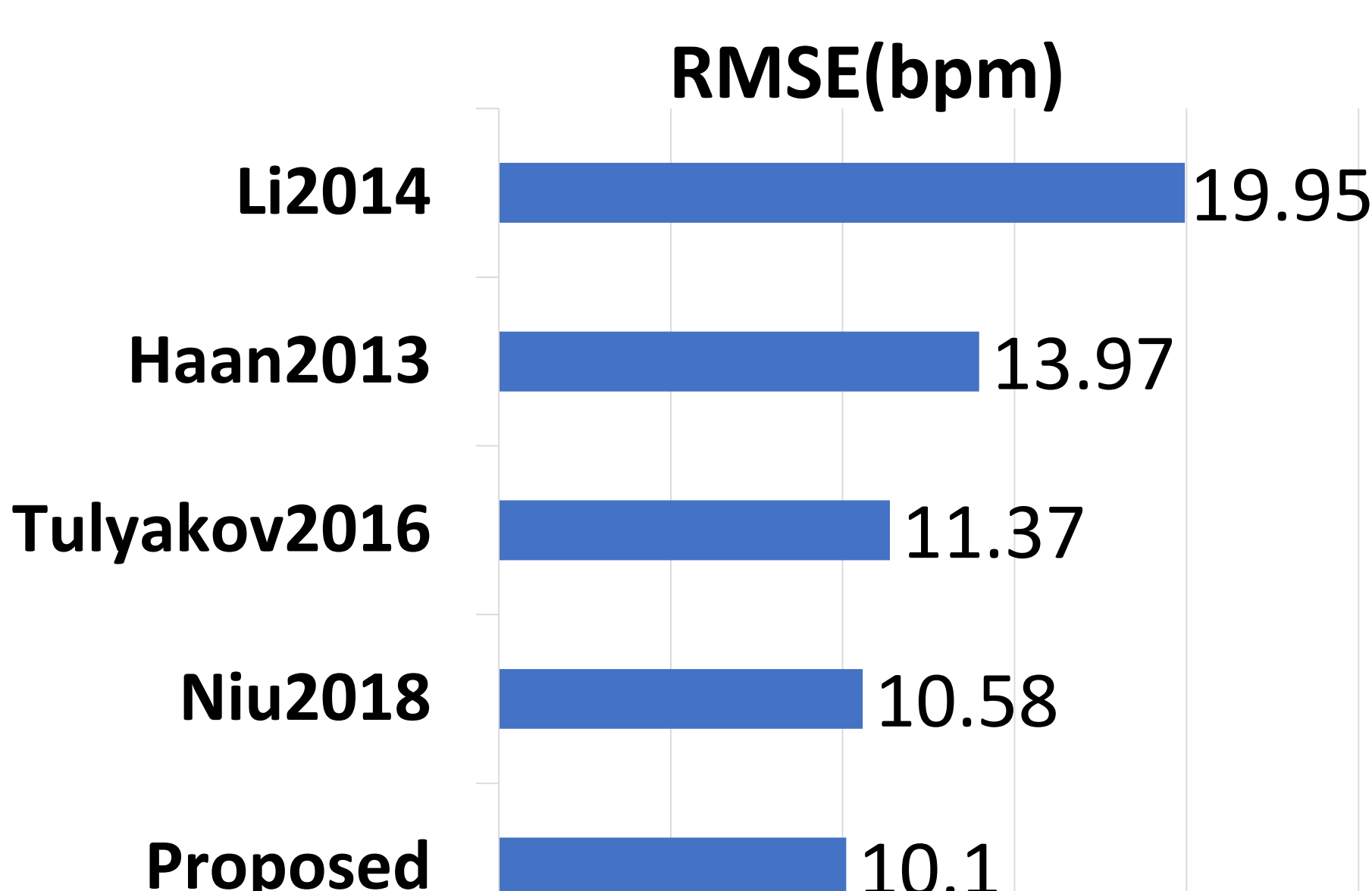


[http://vipl.ict.ac.cn/vie\\_w\\_database.php?id=15](http://vipl.ict.ac.cn/vie_w_database.php?id=15)

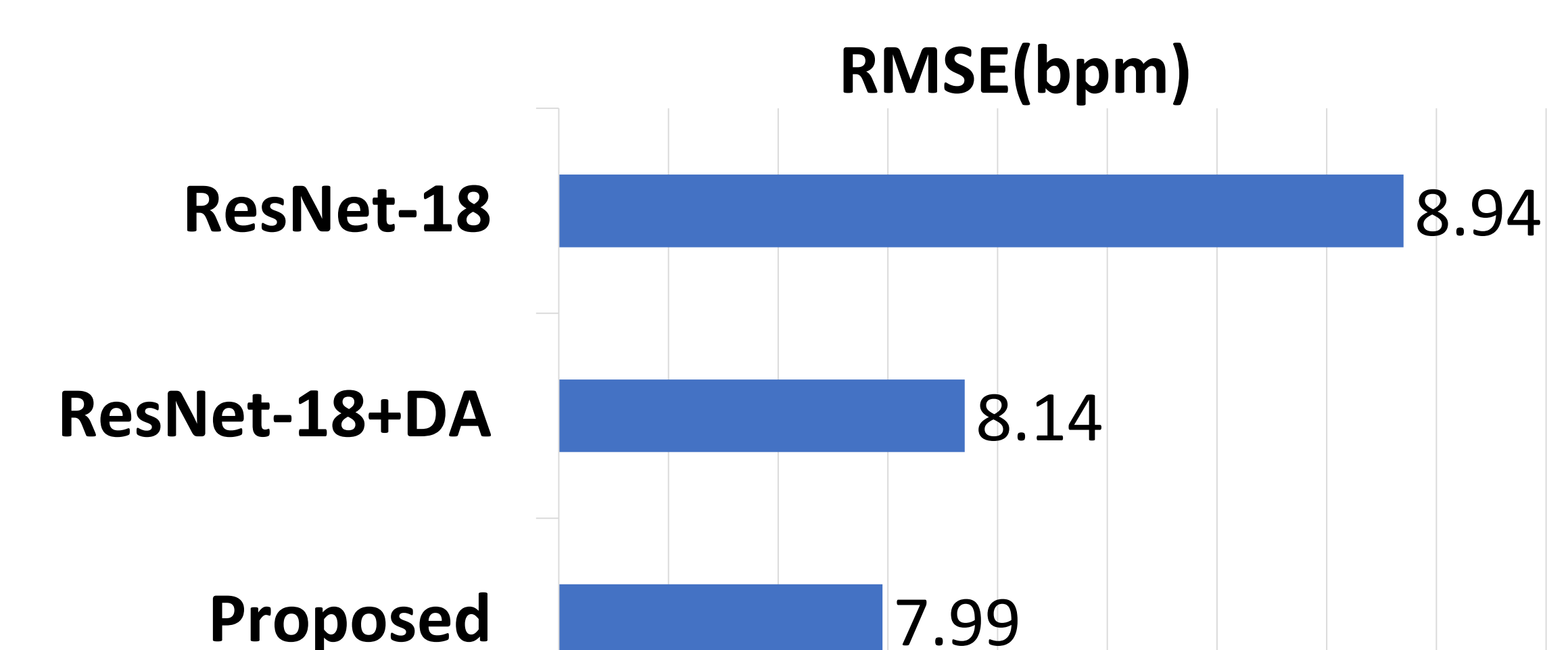
### ➤ Within-database testing



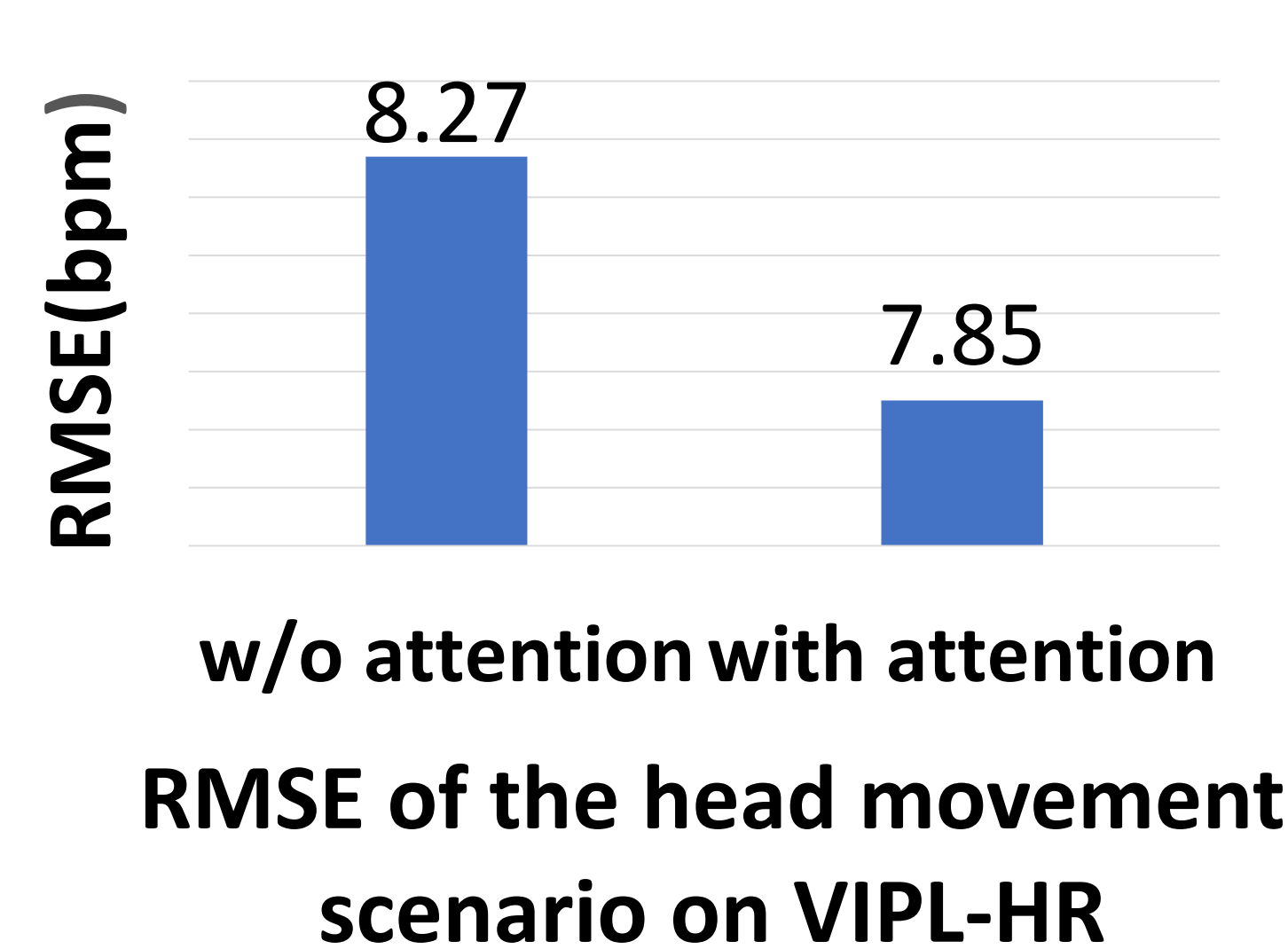
### ➤ Cross-database testing



### ➤ Ablation Study on VIPL-HR



### ➤ Effectiveness of Attention



### ➤ Effectiveness of DA

