

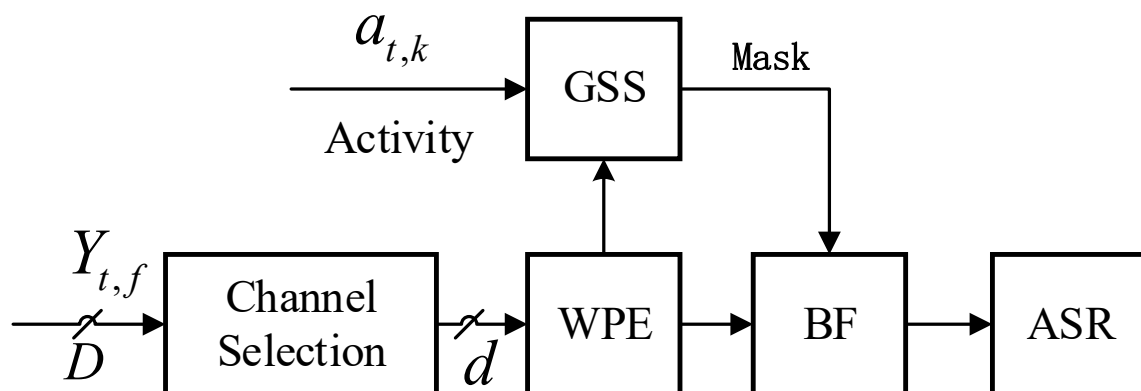
The Qdreamer Systems for Chime6 Challenge

Team: Qdreamer

Member: Haoyuan Tang, Huanliang Wang, Jiajun Wang
Li Zhang, JiaBin Xue, Zhi Li



Front-end Processing



Front-end system

worn	mutiple array
L	ch1+ch4 ch2+ch4 ch3+ch4
L+R	all ch1 ref-array

Channel selection for training data

mutiple array
ch1+ch4 ch2+ch4 ch3+ch4 all

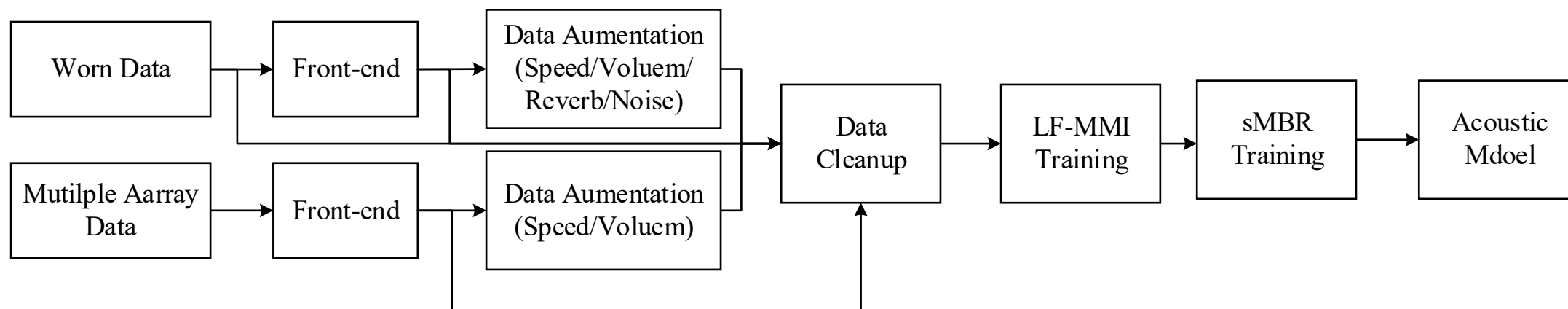
Channel selection for test Data

Data Preparation



- Training Data
 - D1) Original Worn Microphone Data
 - D2) Multiple array data with 6 types of channel selection after front-end processing along with speed perturbation and volume perturbation
 - D3) Worn microphone data with 2 types of channel selection after front-end processing along with speed perturbation, reverberation simulation and noise perturbation
- Test Data
 - Multiple array data with 4 types of channel selection after front-end processing

Acoustic Modeling



Training procedure

Acoustic Modeling



- Effect of different types of training data
 - MFCC feature, dim=40
 - Ivector, dim=100
 - Baseline TDNN-F network
 - LF-MMI criterion

Data	dev
baseline	51.73
D1+D2	46.48
D1+D2+D3	45.87

- Network architecture
 - TDNN-F with 30 layers
 - CNN-TDNN (11-layer CNN + 20-layer TDNN)
 - CNN-TDNN-LSTM

Model structure	dev
baseline	45.87
TDNN-F(30)	45.19
+sMBR	44.69
CNN-TDNN	44.48
+sMBR	44.05
CNN-TDNN-LSTM	44.97
+sMBR	44.06

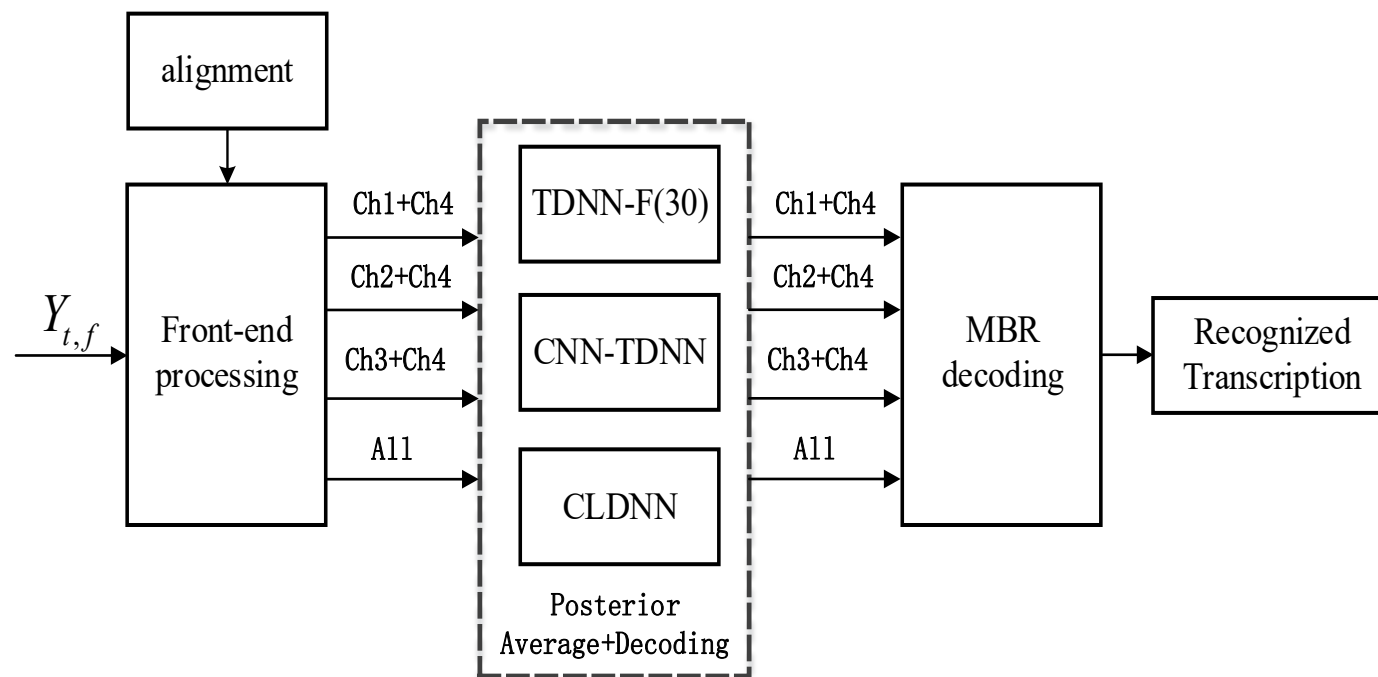
Decoding

- 2-stage decoding

- Refine activity in front-end using alignment

- Model Combination

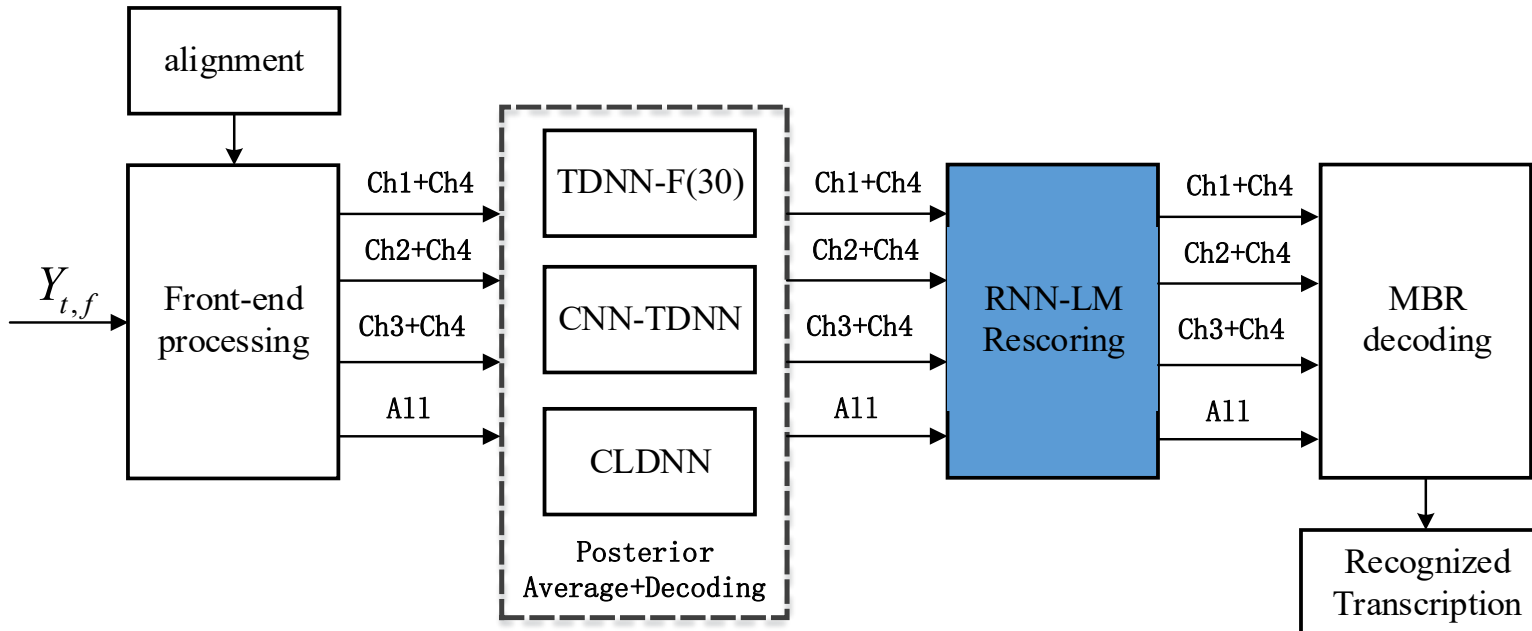
- Posterior average across different network architecture
- Minimum bayes decoding across 4 types of test data



method	dev
posterior averaging	41.52
+alignment	39.71
+MBR decoding	37.59

Rescoring

- RNN-LM
 - 2 layer LSTM models
 - Forward and back-ward directions



method	dev
baseline lm	39.71
+RNN-LM	37.99
+MBR decoding	35.95

Final Results



- Category A

Track	Session	DINING	KITCHEN	LIVING	Overall	
track1	Dev	S02	41.42	43.35	34.76	37.59
		S09	36.64	34.95	33.45	
	Eval	S01	33.26	53.93	45.95	38.99
		S21	31.74	45.25	31.82	

- Category B

Track	Session	DINING	KITCHEN	LIVING	Overall	
track1	Dev	S02	39.59	41.83	33.52	35.95
		S09	34.66	33.13	31.48	
	Eval	S01	31.69	52.32	44.99	37.45
		S21	30.00	43.52	30.23	



Thanks!