VINP [Submitted to IEEE/ACM Trans. on TASLP]

1. Introduction

This repo is the official PyTorch implementation of **'VINP: Variational Bayesian Inference with Neural Speech Prior for Joint ASR-Effective Speech Dereverberation and Blind RIR Identification'**, which has been submitted to IEEE/ACM Trans. on TASLP.

2. Usage

Temporarily unavailable

2. Results

2.1. Speech Dereverberation Results on REVERB

TABLE II: Dereverberation results on REVERB (1-ch)

Method	SimData							RealData				
	PESQ	ESTOI	DNSMOS		WER (%)			DNSMOS		WER (%)		
			P.835	P.808	tiny	small	medium	P.835	P.808	tiny	small	medium
Unprocessed	1.48	0.70	2.37	3.20	12.7	5.6	4.7	1.31	2.82	21.1	7.7	5.6
Oracle	-	-	3.76	3.90	7.4	4.5	4.1	-	-	-	-	-
GWPE [4]	1.57	0.72	2.41	3.22	11.9	5.4	4.7	1.43	2.83	17.7	7.0	5.5
SkipConvNet [58]	2.12	0.81	3.20	3.60	12.9	6.4	5.3	2.74	3.32	26.1	9.3	7.4
CMGAN [23]	**2.85**	**0.90**	**3.82**	3.81	9.2	5.1	4.5	**3.86**	**4.00**	12.5	5.8	5.2
StoRM [25]	2.34	0.86	**3.73**	**3.96**	11.4	6.0	5.1	**3.72**	**4.01**	16.8	9.9	9.7
TCN+SA+S [15]	2.59	0.86	3.50	3.73	11.8	6.5	5.0	3.37	3.73	23.0	12.9	6.7
oSpatialNet* [54]	**2.87**	**0.92**	3.54	**3.88**	8.7	**4.8**	**4.3**	3.39	3.86	**10.3**	**5.3**	**4.5**
VINP-TCN+SA+S (prop.)	2.51	0.87	3.47	**3.88**	8.8	5.1	4.4	3.17	3.77	11.5	6.2	5.1
VINP-oSpatialNet (prop.)	2.82	**0.90**	3.48	3.86	**8.1**	**4.8**	**4.3**	3.32	3.80	**9.1**	**5.0**	**4.3**

2.2. Bline RIR Identification Results on SimACE

TABLE III: Blind RT60 and DRR estimation results on SimACE

Method	RT60 (s)		DRR (dB)	
	MAE	RMSE	MAE	RMSE
Ratnam's [61]	0.151	0.182	-	-
Jeub's [62]	-	-	7.14	8.69
BUDDy [35]	0.089	0.132	3.93	4.57
VINP-TCN+SA+S (prop.)	**0.079**	**0.094**	**3.83**	**4.27**
VINP-oSpatialNet (prop.)	**0.079**	**0.098**	**3.87**	**4.32**

3. DEMO

Please use Microsoft Edge browser or IE borwser to play the recordings.

Method	SimData		RealData	
Unprocessed	demo1	demo2	demo3	demo4
Oracle	demo1	demo2		

GWPE	demo1	demo2	demo3	demo4
SkipConvNet	demo1	demo2	demo3	demo4
CMGAN	demo1	demo2	demo3	demo4
StoRM	demo1	demo2	demo3	demo4
VINP-oSpatialNet (prop.)	demo1	demo2	demo3	demo4
VINP-TCN+SA+S (prop.)	demo1	demo2	demo3	demo4