

ass\_geo

asr: combined softmax, LSTM, 1024 cell  
lang: raw label, LSTM, 1024 cell  
asr-lang: LSTM, 1024 cell, multi-task (asr & lid)  
asr-l: asr from ass  
swbd-asr: LSTM, 1024 cell

model	Cavg frame/utt	EER% frame/utt
i-vector		
lstm_lang_cell_1024	0.1545 0.0905	16.20 9.20
asr_as_front_lstm	0.0776 0.028	8.14 3.04
multitask_asr_lang	0.0822 0.0399	8.68 4.10
ASR posterior		
multitask_asr_lang_pst		
asr-lang_r_to_i	0.0762 0.0298	7.99 3.25
asr-lang_r_to_f	0.0765 0.0280	8.01 3.20
asr-lang_r_to_o	0.0752 0.0286	7.91 3.15
<b>asr-lang_r_to_g</b>	<b>0.0726 0.0264</b>	<b>7.57 2.92</b>
asr_r_to_o	0.0801 0.0298	8.38 3.28
asr_r_to_g	0.0795 0.0283	8.38 3.08
lang_r_to_o	0.1310 0.0638	13.67 7.00
lang_r_to_g	0.1279 0.0640	13.45 6.95
asr-l_r_to_o	0.0942 0.0375	9.81 4.10
asr-l_r_to_g	0.0900 0.038	9.49 4.05
swbd-asr_r_to_o		
swbd-asr_r_to_g	0.0970 0.0385	10.18 4.10
swbd-asr-tdnn_last_to_o		
swbd-asr-tdnn_last_to_g		

ass\_geo

lang: raw label, LSTM, 1024 cell  
asr-lang: **tdnn**, (2048->256)\*6, multi-task (asr & lid), (-4,

model	Cavg frame/utt	EER% frame/utt
lstm_lang_cell_1024	0.1545 0.0905	16.20 9.20
multitask_asr_lang	0.0822 0.0399	8.68 4.10
tdnn_lid		
tdnn_asr-lang	0.1064 0.0355	11.17 3.75
tdnn ASR posterior		
tdnn_asr_lang_pst		

tdnn\_asr-lang\_last\_to\_tdnn

tdnn\_asr-lang\_last\_to\_o

tdnn\_asr-lang\_last\_to\_g 0.0435 0.0214 4.45 2.40

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**ben\_tur**

lang raw label: LSTM, 1024 cell

asr-lang: LSTM from ass\_geo

model	Cavg frame/utt	EER% frame/utt
lstm_lang_cell_1024	0.1740 0.0813	17.47 8.65
asr-lang_r_to_g	0.0869 0.0194	8.70 2.15

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**ass\_ben\_geo\_tur**

lang raw label: LSTM, 1024 cell

asr-lang: LSTM from ass\_geo

model, output dim 4	Cavg frame/utt	EER% frame/utt
lstm_lang_cell_1024	0.2131 0.1499	21.34 15.75
asr-lang_r_to_g	0.1531 0.0833	15.43 9.27

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**7\_all, ass\_ben\_can\_geo\_pas\_tag\_tur**

lang raw label: LSTM, 1024 cell

asr-lang: LSTM from ass\_geo

asr-lang-tdnn: **tdnn** from ass\_geo, (-4, -3, -2, -1, 0, 1, 2, 3, 4 0

swbd-asr: LSTM, 1024 cell

model	Cavg frame/utt	EER% frame/utt
lstm_lang_cell_1024	0.1987 0.1249	19.11 12.63
asr-lang_r_to_g	0.1454 0.0654	14.12 7.11
asr-lang-tdnn_r_to_g	0.1280 0.062	12.27 6.66
swbd-asr_r_to_g	0.1623 0.0803	15.62 8.34
swbd-asr-tdnn_last_to_g		

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7\_olr, ct-cn, id-id, ja-jf, ko-kr, ru-ru, vi-vn, zh-cn

lang raw label: LSTM, 1024 cell

tdnn\_baseline: tdnn, (-4, -3, -2, -1, 0, 1, 2, 3, 4 0 -2, 2 0 -4

asr: from WSJ, LSTM, 1024 cell

asr-tdnn: from WSJ, tdnn, (-4, -3, -2, -1, 0, 1, 2, 3, 4 0 -2, 2

model	Cavg frame/utt	EER% frame/utt
lstm_lang_cell_1024	0.2467 / 0.1983	25.70 / 20.33
lstm-3_baseline	0.2295 / 0.1908	23.93 / 20.35
tdnn_baseline	0.2599 / 0.1900	26.14 / 18.94
asr_r_to_g	0.1961 / 0.1432	20.50 / 14.82
asr-noise_r_to_g		
asr-tdnn_to_g	0.1857 / 0.1183	18.99 / 11.96
asr-tdnn_to_ifog		
asr-tdnn-noise_to_g	0.1907 / 0.1178	19.67 / 12.50
tdnn_to_tdnn-affine6	0.2570 / 0.1869	24.84 / 18.36
tdnn_to_lstm-3_g123	0.1850 / 0.118	18.82 / 12.15
asr-tdnn_to_g_no-input	0.1683 / 0.0697	17.08 / 7.57
asr-tdnn_pre-affien_to_g	0.2231 / 0.1755	23.31 / 18.35
asr-tdnn_pre-lda_to_g		

model	length <=200	<=300
lstm utt-Cavg		0.164349903
asr-tdnn_to_g utt-Cavg		0.078369984
lstm frame-Cavg		0.220877668
asr-tdnn_to_g frame-Cavg		0.164899774
lstm utt-EER	6.9	12.55
asr-tdnn_to_g utt-EER	3.45	5.7
lstm frame-EER	10.51	18.08

datasets	#frames
ass	2694, 8168
ben	3134, 1111
can	6307, 5828
geo	2299, 7268
pas	4000, 8931
tag	4165, 2554
tur	3867, 3022

WER%  
on test1/test2

68.20 / 65.50

68.90 / 66.00

-3, -2, -1, 0, 1, 2, 3, 4 0 -2, 2 0 -4, 4 0)

WER%  
on test1/test2

66.4 / 64.4

) -2, 2 0 -4, 4 0)

, 4 0)

0 -4, 4 0)

Cavg_cafe_9dB frame/utt	EER%_cafe_9dB frame/utt
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0.3420 / 0.2890    36.31 / 30.30

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0.3012 / 0.2348    31.65 / 26.86

0.3080 / 0.25    31.77 / 26.08

0.276 / 0.2064    28.69 / 23.58

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0.2916 / 0.2225    30.30 / 23.56

0.3370 / 0.2960    35.29 / 30.17

<=400	<=500	<=600	<=700	<=800	<=900	>900
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0.182306342    0.189230588    0.205286933    0.22295665    0.21050205    0.2088917

0.095406517    0.096145505    0.121009938    0.14400711    0.15219799    0.1495571

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0.230539191    0.233658705    0.246638431    0.26342747    0.26291793    0.255087

0.168548351    0.167994657    0.184597556    0.19982938    0.2115181    0.1997156

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18.49    20.03    22.54    22.16    23.5    23.37    33.02

10.12    10.35    12.95    14.02    15.22    16.12    23.72

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23.72    24.61    26.27    25.79    26.89    26.23    36.13

17.69

17.65

19.13

18.82

19.94

19.66

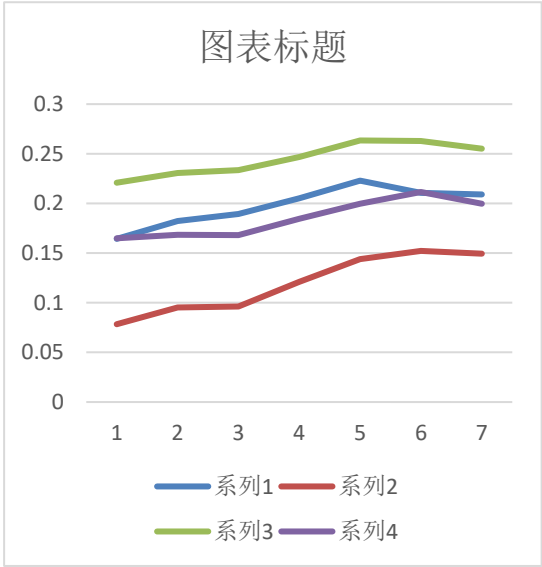
26.55

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图表标题

