Supplementary Materials of the Paper 1077 "Write Like You: Synthesizing Your Cursive Online Chinese Handwriting via Metric-based Meta Learning"

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1 MONOTONIC ATTENTION

Monotonic attention mechanism [4] attends to the memory (i.e., output of content encoder $[\mathbf{h}_{c,1}, \mathbf{h}_{c,2}, ..., \mathbf{h}_{c,N}]$ in our case) in a monotonic manner: if the decoder attends to the $\mathbf{h}_{c,t_{i-1}}$ at previous decoding time step i - 1, at current decoding time step i, we begin processing memory entries starting at index t_{i-1} , namely we calculates the score scalar of $\mathbf{h}_{c,j}$ for $j = t_{i-1}, t_{i-1} + 1, ..., N$. Then we use a logistic sigmoid function $\sigma(\cdot)$ to transform these score scalars into probabilities $p_{i,j}$ and sample $z_{i,j}$ from a Bernoulli distribution parameterized by $p_{i,j}$:

$$\alpha_{i,j} = \operatorname{score}(\boldsymbol{h}_{i-1}, \boldsymbol{h}_{c,j}) \tag{1}$$

$$p_{i,j} = \sigma(\alpha_{i,j}) \tag{2}$$

$$z_{i,j} \sim \text{Bernoulli}(p_{i,j}),$$
 (3)

where score($h_{i-1}, h_{c,j}$) measures how well h_{i-1} and $h_{c,j}$ match, which can be defined as described in [1] or [3]. The sampled $z_{i,j}$ in Equation (3) is a binary value that determines whether to pick $h_{c,j}$. As soon as $z_{i,j} = 1$ for some j, we stop and set $t_i = j$ and $c_i = h_{c,j}$. Note that $z_{i,j}$ is sampled from a Bernoulli distribution, thus the model can not be trained using backpropagation. As suggested in [4], we can use the soft monotonic attention and compute the expected value of c_i over complete memory.

2 EVALUATION METRIC

2.1 DTW

We use the DTW distance to evaluate the accuracy of coordinate prediction. As described below, we keep the same calculation method of DTW as [5].

(1) Convert the target and the predicted offsets (i.e., relative coordinates) into corresponding absolute coordinates *C* and *C*':

$$C = [(x_1, y_1), (x_2, y_2), ..., (x_{|C|}, y_{|C|})]$$

$$C' = [(x'_1, y'_1), (x'_2, y'_2), ..., (x'_{|C'|}, y'_{|C'|})],$$
(4)

where |C| and |C'| are the lengths of *C* and *C'*, respectively.

(2) Normalize the DTW distance between C and C' by the spatial scale and length of real handwriting to eliminate the effects of different scales and lengths:

normalized DTW(C, C') =
$$\frac{\text{DTW}(C, C')}{|C|\sqrt{(x_{max} - x_{min})^2 + (y_{max} - y_{min})^2}},$$
 (5)

where

$$x_{max} = \max_{i=1}^{|C|} x_i, \quad x_{min} = \min_{i=1}^{|C|} x_i$$

$$y_{max} = \max_{i=1}^{|C|} y_i, \quad y_{min} = \min_{i=1}^{|C|} y_i.$$
(6)

2.2 Content Score and Style Score

We utilize two classifiers to quantitatively evaluate the generated handwriting in terms of content and style separately. The architectures of these two classifiers are depicted in Fig. 1.

For the content evaluation, we train a character recognizer (see Fig. 1(a)) on the training set and use recognition accuracy as the Content Score. We randomly select 20% of the training set as the validation set. We use the Adam [2] optimizer to train the recognizer with the batch size of 1024, learning rate of 0.001 and gradient clipping of 1.0. For data augmentation, we multiply the offset (Δx , Δy) by a random scale factor in the range [0.90, 1.10] and dropping some points randomly with a probability of 0.10. After training, the validation accuracy is 0.9702, and the accuracy on the test set is 0.9627.

For the style evaluation, we train a writer identification network (Fig. 1(b)) that is a 4-layer LSTMs with hidden sizes of 256 on the test set which contains 60 writers. The specific training settings are the same as the character recognizer above. After training, the validation accuracy is 0.9112.

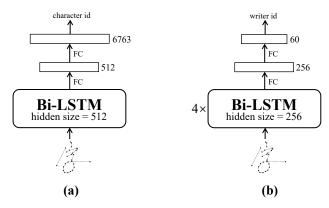


Fig. 1. The architectures of our two classifiers to score the generated handwriting in terms of content (a) and style (b), respectively.

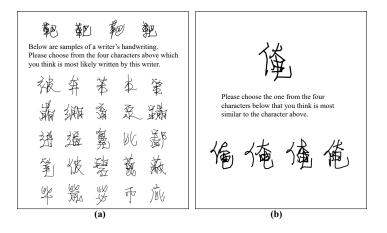


Fig. 2. Two examples of the user study questionnaires described in Section 5.4.2 and 5.5.2, respectively.

3 USER STUDY QUESTIONNAIRES

In our paper, we conduct two use studies which are described in Section 5.4.2 and 5.5.2, respectively. The examples of these two questionnaires are shown in Fig. 2.

In the first user study, we ask participants to point out one character from the four candidates which they think is most likely written by that writer. The four randomly arranged candidates are the genuine handwriting, handwriting generated by our model without and with fine-tuning, and the same character written by a random different writer.

In the second user study, the participants need to choose the one out of the four candidate fake handwritten characters that is most similar as the real one. The four randomly arranged candidates are generated by DeepImitator [6], FontRNN [5] and our model without/with fine-tuning, respectively.

REFERENCES

- Dzmitry Bahdanau, Kyunghyun Cho, and Yoshua Bengio. 2014. Neural Machine Translation by Jointly Learning to Align and Translate. CoRR abs/1409.0473 (2014).
- [2] Diederik P. Kingma and Jimmy Ba. 2014. Adam: A Method for Stochastic Optimization. CoRR abs/1412.6980 (2014).
- [3] Thang Luong, Hieu Pham, and Christopher D. Manning. 2015. Effective Approaches to Attention-based Neural Machine Translation. In EMNLP.
- [4] Colin Raffel, Minh-Thang Luong, Peter J Liu, Ron J Weiss, and Douglas Eck. 2017. Online and linear-time attention by enforcing monotonic alignments. In Proceedings of the 34th International Conference on Machine Learning-Volume 70. JMLR. org, 2837–2846.
- [5] Shusen Tang, Zeqing Xia, Zhouhui Lian, Yingmin Tang, and Jianguo Xiao. 2019. FontRNN: Generating Large-scale Chinese Fonts via Recurrent Neural Network. In *Computer Graphics Forum*, Vol. 38. Wiley Online Library, 567–577.
- [6] Bocheng Zhao, Jianhua Tao, Minghao Yang, Zhengkun Tian, Cunhang Fan, and Ye Bai. 2020. Deep imitator: handwriting calligraphy imitation via deep attention networks. *Pattern Recognition* (2020), 107080.

A APPENDIX

Here we show a large number of generated results. Each page corresponds to one test writer.

w/o FT	班	粟	甜	莇	庖	隨	和名	廢	废	的時	绑	擬	う反	枹	披
FT-100	斑	蜜	鉼	嚴	Q	陵	般	腑	安	ÞÞJ	绑	撰	位	饱	披
Ground truth	ÐŁ	家	斜	嚴	豆	隘	般	敶	灾	网	挪	摸	佰	卿	按
w/o FT	谚	私	碍	褒	宝	白	版	霌	凤	拔	埃	裞	以上	rg\	PE -
FT-100	谗	袍	碍	褒	宝	白	椒	彭	团	掖	堠	袂		$\mathbb{Q}^{\mathbb{N}}$	独
Ground truth	澹	桩	函	褒	- AND	任	版	西		扳	摸	祆	格日	낎人	快量
w/o FT	奧	袟	皑	¥	剏	堡	Ľ	稗	公司	饝	坝	蓮	颁	MAR	教
FT-100	奧	拚	膛	≱	쾬	堡	F	掙		髈	㧐	撛	厥	NA	数
Ground truth	奥	拚	的	半	翘	堡	Ħ	拜	Ê	虢	坎	谨	ŇŔ	逐	敖
w/o FT	磅	俺	扒	邦	夏	俶	界	搬	敖L	倮	M	揭	霸	膈	翱
FT-100	磅	愑	ħ	邦		傲	A	搬	₩£	保	M	膨	霸	驞	皋羽
Ground truth	确	馑	扒	邦	资	傲	T	搬	₿₽	係	凹	癌	R	旺量	颖
w/o FT	八	稗	R	靶	pB	摆	H	ţ	赦	שמ	都	苞	뼱	ħ	磨
FT-100	八	稗	剢	都	ÞÐ	攫	¥4	¢	敖	Ø	帮	¥ R	燠	戚	膀
Ground truth	八	帶	劉	靶	₿₫	摺	X	¥	敖	Ω Ľ	報	彭	懊	水	쪥
w/o FT	棒	唉	朝	蔼	山戸	梆	蔽	航	瓣	Ť.	併	椿	败	R	疤
FT-100	棒	唉	鞜	塔	Ē	柳	秾	胐	瓣	₩ I	併	楼	败	R	呃
Ground truth	棒	晓	斔	藻	岸	椰	板	魀	鞹	赵	伴	榜	败	ШX	疱

ME墓绅跋同着殷膀安啊娜挨佰他按 w/o FT 班豪洋战员隆彩膀安啊狮族侗鲍梅 FT-100 豪俸颜色惨般爱好丽谢摸住绝趣 ₩₽ Ground truth 常柏碍褒宝白版電包板谈铁管叭弦 w/o FT 常物得愿宜白版零包扣煤铁筑阶楼 FT-100 柏耀豪气江的老包板旗被管叭烙 Ground truth 能书把堡巴拜爸镑饭薄颜氨熬 w/o FT _防管半耙堡巴拜爸锩炊薄颜氲熬 FT-100 - 腌棉和管巴麻爸铮吹摩汤豪熬 Ground truth 俺扒那盎像昂搬强保凹鹰霸暗翱 W/OFT THE 磅俺扒邦卷徽昂搬艇保四鹰霸暗翔 FT-100 磅億扒虾卷飲品搬路四叠霸晚翱 Ground truth 梅新乾阿摆罢艾教吧帮苞懊办胯 w/o FT 八年刷乾网摆罢艾敬吧帮苞燠办腾 FT-100 ·释 刹 袍 所 撂 呈 史 教 吧 帮 奇/要 水 慶 Ground truth 唤鞍蕃岸挪板脱鳞芭伴樗蚊哎疤 椿 w/o FT 棒喉鹌猪岸柳板脑瓣芭伸榜败喉疤 FT-100 **檬喉鹅蘑岸柳柳般颜色伴静默哎疤** Ground truth

w/o FT	班	安米	謎	旇	百	了一番	殷	膨	È	啊员	鄉	挨	佰	抱	撼
FT-100	册	家	掷	嚴	G	酷	殷	胺	È	财	鄉3	뚅	佰	的	接
Ground truth	Ì	寨	铤	١Ę	G	藡	般	臉	À	UBŋ	谢	族	倚	HP)	Ŕ
w/o FT	谤	扨	碍	慶	宝	Ð	版	围	包	扳	堠	裞	KP	12/	矮
											埃				辑
Ground truth	谚	桷	12	饔	宜	Te	Ala	尾	æ	扳	壤	被		W/~	嬢
w/o FT	奥	扮	皑	4	耙	堡	P	释	金	軉	坝	薄	颁	E.	熬
FT-100	奧	扮	闿	*	耙	堡	P	拜	爸	誇	腴	蒋	颁	E.	配
Ground truth	更	朸	턘	¥	帮	Æ	B	释	à	艩	坡	薄	颁	氨	舷
w/o FT	磄	俺	扒	邦	史里	傲	12p	搬	斑	保	Wh	The	哥	隋	翱
												_			
FT-100	磄	俺		郭	齿	傢	P	搬	税	保	m	Ā	丁朝	腈	翻
												``	-	睛	
	磅	俺	扒	勘	壺	锻	J. J.	椴	嵌	係		``	Ţ		
Ground truth	磅八	俺稗	扒扒	勘靶	毒酮	骰攫	即罢	般艾	嵌数	保吧		靈苞	戰懊	晴办	飘腾
Ground truth w/o FT	磅 八 八	俺稗稗	かれ剥剥	谢 乾 乾	壶 两 两	般摆摆	命罢罢	般文文	安教教	保吧吧	凹郡	靈苞苞	軍火候	暗办办	静榜
Ground truth w/o FT FT-100	<u>磅</u> 八八八 八八	俺都稱種	れれ 剥 剥 剥	谢 彰 彰 乾	静 阿	般摆摆	命罢罢罢	粮 丈 丈 艾	斑数数数	像 吧 吧 吧	凹帮帮	靈苞苞苞	戰艘懷慶	晴灰办办	鄂唐唐
Ground truth w/o FT FT-100 Ground truth	磅八八八 棒	俺都祥稗喉	れれ 剥 剥 剥	朝 彰 乾 乾 義	 一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一	般摆摆摆梆	命罢罢罢叛	粮艾艾艾脱	斑教教教	绿吧吧吧芭	凹帮帮帮	靈庖庖庖榜	戰惧慢慢败	屠办办办	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

w/o FT	班	安果	锚	Bk	G	朣	殷	腤	安	₽₽¢	卶	换	佰	抱	推
FT-100	ŧΙZ	富和	绊	BE	75	N.	殷	胺	安	opg	绑	换	佰	物	按
Ground truth	驱	「日子	1	26	丙	隘	Ŕ	屐	12	ong	33 K	授	伯	nb.	挨
w/o FT	湯	桷	碍	複	宜	向	Kk	围	包	扳	擌	4R	pk B	¢∧	镂
FT-100	塘	柏	73 T	褒	Ê		版	雨包	Ø	扳	堠	祝	Phi B	ρλ	袋
Ground truth	湾	拘	育	褒	ET.	5	KQ	P	Ø	扳	梭	稅	10 M	Q/	13
w/o FT	奧	拚	白色	¥	耙	僅	B	拜	畜	镑	俶	薄	颁	LI B	敖
FT-100	更	扮	甝	¥	粌	堡	EN J	掙	合	糖	Ŕ	H.	統	E	南公
Ground truth	P	粝	AND IN	¥	P	仔上	N	租	to	镑	K	崩	R	氣	E.
w/o FT	磅	俺	扒	护	的	傲	Fp	搬	1kl	保	pŋ	痘	莿	扇	氧
FT-100	18	佰	扒	邦	ALBI B	徽	P	搬	敬3	保	ND	痃	雨轨	日志	翻
Ground truth	磅	俺	扒	救	大山	伟	界	概	ĪRĪ	僎	[1]	tog	雨	D I	宰砜
w/o FT	\backslash	7 4	FM	ŧ	ßğ	摆	PE	Ł	敖	DP	邦	苞	廮	Ŕ	膀
FT-100	$\mathcal{I} \setminus$	稗	剥	韵	阿	攪	BH	史	穀	рB	却	志	燠	đ	脖
Ground truth	ハ	捉	剥	\$C	阿	1Z	and the	t	郡	10	那中	E.	燠	み	ANS .
w/o FT	掃	唉	巃	蓝	FF	抑	扳	俬	瓢	苞	伴	拷	RX	皮	疕
FT-100	棒	唆	韵	拔	À	邾	极	陇	瓢笋	Res -	併	榜	RX	败	疱
Ground truth	择	唆	鉄	濱	A.	挷	扳	AL	新洋	HI.	倅	梈	RA	烕	庖

w/o FT	砸	康	祥	嚴	反	蓪	殷	Æ	Ì	рβЪ	绑	援	循	例	括
FT-100	狵	窠	鄬	3A	反	3	般	Ŕ	Ì	nßfo	鄉	挠	傾	抱	挹
Ground truth	2/2	家	谦	腋	虿	遥	K	艖	Ŷ.	DBY	御	喉	傾	乾	PH-
w/o FT	湾	构	碍	傻	Ż	包	敞	E.		散	娭	裞	jete. E	m	頀
FT-100	澹	构	λĝ	夜	Ż	Ŕ	版	R	包	掓	侯	旅	MAR	m	糖
Ground truth	谤	构	碍	TRA NO	R.	反	旅	He I	R	the	堠	裉	N.	μĄ	腰
w/o FT	Ł	伤	魁	¥	祀	1/16 L	R	薭	Ê	ł	殷	薄	颍	罰	款
FT-100	夓	拐	鹤	¥	耙	RE	R	苒	RE	纬	腴	博	8h	Still	船
Ground truth	屢	惕	胞	¥	靓			辞	K	鬱	执	T	'BR	R	极
w/o FT	礸	俺	Ŧŋ	邦	大田	侬	ID IP	搬	BA	儏	M	J'me	TR	腐	匑
FT-100	谱	俺	ħ	邦	Shape -	很	P	搬	铤	保	M	Ym	豪	腦	影的
Ground truth	BE	儼	đV	\$PS	遊	徽	FP-	嚴	Eas)	僚	凹	Jun Jun	FAR AN	A A	翱
w/o FT	\mathcal{I}	稗	F)	靶	防	攫	罢	艾	毅	pR	帮	苞	廮	Ð	臒
FT-100	$\backslash $	F2	R	靶	379	擢	P	Z.	羲	WP.	帮	帮	廮	办	RE
Ground truth	$\backslash $	稗	Ŧ	靶	ВÍ	图	DA	H X	散	m	No.	创	慶	办	醇
w/o FT	棒	ng	弱	諸	JA -	椰	极	Ŕħ	鎆	AND	俾	栲	pk	nt	Ē
FT-100	棒	NZ.	F	H K	岸	靜	the	Rh	誗	芭	揮	榜	RR.	败	疤
Ground truth	懩	10家	靜	H	山戸	椰	FK.	#h	瓣	Ē	伴	栲	版	哎	疤

WOFT 聽案準跋百隆殷慶安明鄉族領炮撥
FT-100 砚案绊皱肩隘般腰牙啊绑旗俑帕旗
ground 如奥华城同隘船够岳啊柳族侗胞格
WOFT ····································
17-100 傍梅得褒宝白版圈包换族铁管阶矮
ground 源柏醇猿宝白板围包板城铁圈心袋
WOFT奥捞鲍半耙堡巴拜爸镑坝薄领氯熬
17-100 奥榜館牛耙堡巴拜爸镑姻薄领氯熬
Ground 奥虎绝半舰堡巴科管熊旗旗象旗
WOFT 磅德扒和 卷像 吊鹅 既保凶 强 霸 暗 寡 限
FT-100 磅億扒押卷微易搬艇保凹燈影晴察
ground 减危水和卷微品腺放丹、凹感、霸暗翱
WOFT儿辨别靶所摆罢艾教吧帮苞懊吸腾
FT-100 八榔副靶阿摆罢丈数吧帮苞腹西膀
Ground 八旗刻靶的摆装之教吧帮 勘擦办院
*** 權踐難臺岸柳板航褲芭伴榜败咳疤
FT-100 磷喉鞘霉岸柳板航瓣菌伴r 的版现疤
FT-100 磷喉鞘莓岸柳板航瓣巷伴榜战坡疤 Ground 橡喉鞘菇岸椰板航瓣巷伴榜战坡疤

w/o FT	弬	ight	ジ	跋	石	蘆	觬	服	È	043B	纲	援	佰	的	拖
FT-100	WE	蜜	20	駥	Pa	隘	般	. AE	Ì	nßG	绑	援	低	勉	报
Ground truth	Ψù	(A)	ź¢	Ëta	百	福	酮	₹¥Ê	B	12km	琊	挨	Fo	No.	胙
w/o FT	谤	构	褐	夜夏	Ŕ	白	Kia	雨电		扳	诶	欲		W	韬
FT-100	薨	桶		赓	Ì	Q	the.	围	P)	扬	堠	诚		h/	雜
Ground truth	谚	物	ゐ	褒	安	Ŕ	肠	FRE	12	振	巅		ht.	121	惊
w/o FT	夓	扮	品之	¥	耙	堡	P	57 3)	父已	镑	俶	故海	领	A	熬
FT-100	罺	扮	的	ŧ	护		P	颖	爸	镑	贩	故鸿	领	E B	数
Ground truth	P	扮	A.	¥	豝	星	Ð	775	APP)	谚	tR	潮	领	局	驳
w/o FT	礦	俺	扒	郭	RE	儭	B	搬	斑	保	NY	The	副	腯	鲁阳
FT-100	礦	偏	扒	邦	R	傲	R	搬	砚	保	ny	The	酮	R.	朝科
Ground truth	7.7	,			1										
	My	掩	扒	郡	K	傲	ħ	搬	. YZV	保	U	融		ØB.	嗣
w/o FT	八	掩賴	扒	郭靶	BE	傲搜		搬艾		RE PP	辺 祝			胳办	駒腾
w/o FT FT-100	<u>から</u> 八 八				BB		E		敬	np		嬴	FA	Ø.	<u> </u>
	<u>加労</u> 八 八 へ	梅	af y	靶	BB	攫	E	艾艾	教教教	ne ne pe	招帮帮	ふも、	劉懊	胳办	腾
FT-100 Ground	小八八の棒	梅額	RAN RAN	草草	PR	摆摆	RES RES	艾艾女	教教教	肥肥超	招帮帮	藏苑苞	劉懊懷	略办办力	磨腾
FT-100 Ground truth		柳柳神	AF AF AF	草草野	PA PA PA	搜搜搜	ES ES ES	艾艾女航	教教教	吧吧吧艺	招帮帮	藏苞苞意	劉懊懷慶	略办办力	膀膀胱

WOFT 砸案 绯 跋 頁 隨 殷 胺 安 BPJ绑 摸 侮 绝 搭 破棄 维 跋 豆 膳 殷 媵 安 啊 鄉 挨 饭 饱 楼 FT-100 推案练跋百险般的安斯编成他的 Ground truth w/o FT 语植得度主血版電包拔埃铁带以矮 FT-100 透胸得变 窑白城 贾 巴 板 族 缺 带 叭 糖 Ground truth 奥 扮 解 半 耙 坐 円 拜 爸 缮 坝 薄 领 惫 覧 w/o FT 奥格鲜书耙堡巴拜色铸坝薄领氛感 FT-100 要指脫老耙堡巴拜爸镑欣康领备教 Ground truth WOFT 磅億扒邦 畫像 吊搬艇保 些 應 霸 臆 翱 FT-100 磺億九邦 遊戲 常搬 联联 四虛 霸 嘴 寧 吸 夢俺刑都盗假界搬避保卫鹿霸暗飘 Ground truth 八锦刹乾阿摆罢之教吧帮制燠办膳 w/o FT 八年别朝阿摆罢皮致吧帮带燠瓜腾 FT-100 1 梅别靶所摇丢某教吧帮管惧的膀 Ground truth WOFT棒质豁蕾岸椰板脱瓣卷伴棒欢戏疤 FT-100 棒啶鹳蔼岸榔板脱癣芭伴椿胶吹疤 棒,突鞍着岸,脚,板纸辘色陡腾,败结枪 Ground truth

w/o FT	巸	氣	绅	馛	B	隘	føz.	略	F	opg	绑	挨	偏	韵	播
FT-100	驰	囊	姨	FG.	6	隨	fra.	雕	R.	opg	朝日	羖	佰	胸	靜
Ground truth	靴	朝	弹	¥£	É	隧	\$PR	Ø£	J.	ØFJ	泖	援	kas	恀	格
w/o FT	谵	Ab	破	褒	宝	6	Kk	曹	包	戕	睃	裓	M	M	铤
FT-100	谵	the	碍	褒	Ł	6	kk.	夏	Ø	ťk	堠	袂	惨	Ŵ	糠
Ground truth	诸	the	76 3	麋	J.	Q	Kk.	唐	8	Fkj	版	袂	KA .	ØN,	繨
w/o FT	夓	Å	战制	书	耙	堡	P	种	k	镄	ÐR.	薄	版	A A	题
FT-100	夓	舫	恸	半	耙	握	P	轷	k	糖	怳	海	kr.	A	敷
Ground truth	霥	势	6Z	事	靶	堡	B	痢	ET.	锩	PR.	旗	砺	AND A	勘
w/o FT	磅	偏	A	#P	AND	傲	P	Ph/2	WE.	保	ng	麛	霸	赌	钢
FT-100	褲	减	A	郭	题	傲	Z	搬	æ	儼	ND	蠯	事	赌	钢
Ground truth	楌	棬	ħ	抑	多	骸	昂	AR /	配	俪	R	R	Ŧ	0Zz	翻
w/o FT	ル	魏	3M	靶	BE)	摺	Ł	Ł	数	vp	帮	お	뼱	R	胯
FT-100	\wedge	稗	Ŧ	觏	ÞF	摆	Æ	Ł	敬	WPB)	帮	荀	뼱	ħ.	腌
Ground truth	η	裨	剐	靶	G	撰	¥/	Ł	R	N/P	帮	Ł	阑	私	幡
w/o FT	樨	唉	靴	福	岸	椰	极	ŔŁ	翰峰	Ê	伸	檂	Rk	wQ.	疤
FT-100	棒	Æ	THE	福	岸	椰	私	MA	¥4	Ð	牌	樈	RR	v\$	柜
Ground truth	棒	se j	轮	韬	1 F	谢	最	ABS.	巅	Ĕ	A	榰	rk,	-dž	屉

w/o FT	班	安禾	锑	Ptc.	B	BE	般	AB	È	ю₿Ър	绑	挨	佰	饱	扮
FT-100	班	穿来	ジキ	跋	百	匠	般	胺	È	17/876	鋓	换	佰	钧	挨
Ground truth	ŧĮ₹	度水	绊	敌		隘	駁	AF	F	073	绑	挨	佰	He	耹
w/o FT	凄	柏	碍	夜	宜	6	版	雨包	Ð	扳	峻	被	KK P	MI	榜
FT-100	谤	柏	る	瘦	宝	白	Kk.	雨包	包	扳	堠	袄	kk P	17/\	妹
Ground truth	礦	彬	福寺		宝	A	版		Þ	the	埃	袄	No the second se	k/\	铁
w/o FT	奥	扮	皑	羊	耙	件里	P	拜	令已	铐	坝	薄	颁	自己	赦
FT-100	奥	扮	皑	¥	耙	保	P	4	令已	皢	坝	調	领	白县	敖
Ground truth	奥	扮	日气	靬	耙	保土	Þ	拜	(Je)		执	調	领	AR	敖
w/o FT	磅	俺	扒	邦	皆	傲	D.P.P.	搬	财	保	ng	孢	雨鞘	日本	导导
FT-100	腐	俺	扒	邦	去	傲	同中	搬	斑	保	60	弬	雷朝	睛	翱
Ground truth	Top	俺	扒	邾	光里	傲	ê Îp	瘕	铤	A	[2]	TEG	() A	瘠	朝
w/o FT	\mathcal{N}	鹅	副	靶	pp	搜	罢	艾	敬	₽ ₽	邦中	苞	燠	か	磨
FT-100	\mathcal{N}	稗	PM	靶	PA	摆	E	艾		r P	帮	苞	[噢	办	膀
Ground		,						,			1 -	1			141
truth] \	頛	N	FP	M	搜	E	艾	敖	60	邦	ち	腹	か、	腠
w/o FT	八椿	粮嗅	剥離	乾禧	阿岸	握柳	置板		瓣	哲	伴	志榜	噢败	办成	<u> 榜</u> 死
truth	. ,						板	肮	瓣	芭	伴	· · ·		成	>