



Figure 4: The illustration of using GPT-2 model as a persona dialogue generator.

244 Appendix A Persona Dialogue Generation as Language Modeling

245 Since the base model is GPT-2, we format the problem as a language modeling task as described
 246 in [18]. We show the process in Fig 4. The personas and previous chatting logs are prepended and
 247 appended with special tokens then concatenated as the prefix input of the language model. The
 248 objective function of the language model is to maximize the probability of generating the suffix of
 249 the input, which is a sequence prepended and appended with special tokens. We also experiment with
 250 the format without adding special tokens, but we discover that adding special tokens improves the
 251 performance. As a result, adding special tokens is the default setting of all experiments in Section 4.

252 Appendix B Experimental Setup

253 We implement all the models by PyTorch [16] and Transformers [26]. All pre-trained GPT-2 models
 254 in this paper load *gpt* in [26] as the parameters. *gpt* is a pre-trained GPT-2 model with 12-layer,
 255 768-hidden, 12-heads, 117M parameters. In meta-training stage, we use SGD for the inner-loop with
 256 learning rate $\alpha = 0.001$ and Adam optimizer [9] for the outer loop with learning rate $\beta = 0.0003$.
 257 The batch size of inner-loop and outer-loop is 4 and 2 respectively. For normal training, we use
 258 learning rate $r = 0.001$ and Adam optimizer with the batch size 16. All models generate samples via
 259 Nucleus Sampling [6] with $p = 0.92$. The training procedure of normal training and meta learning
 260 takes approximately 1 day on NVIDIA GeForce RTX 2080 TI and NVIDIA TITAN RTX respectively.

261 Appendix C Generated Samples

262 We list the generated samples from REINIT GPT-2, Transfer Pre-trained GPT-2, In-place MAMLvi-
 263 aPP, and Extra-place MAMLviaPP alongside with corresponding real data.

Persona

- my parents are living in bora bora.
 - i have a turtle named timothy.
 - autumn is my favorite season.
 - my favorite sport is ultimate frisbee.
-

Dialogue History

USER: hey there . how are you ?
SYSTEM: hey there . i am fine . what about you ?
USER: been better . stressful day at work .
SYSTEM: do you work on sundays ?
USER: yep . i work fast food . always working on a sunday .
SYSTEM: how old are you ? if do not mind to share it .
USER: i am 20 and i have been doing this for 4 years .
SYSTEM: you are too young . do you study ?
USER: no . i left high school at 16 to help my family . trying to get my ged soon .
SYSTEM: i feel so sorry . you should get it soon .
USER: yeah trying my best but helping my family out of these bad apartments is my main goal .

Generated Responses

Real Data: god help you and make you rich one day .
REINIT GPT-2: what about dad ?
Transfer Pre-trained GPT-2: i know . how about moving ?
In-place MAMLviaPP: i love to watch movies , especially ultimate frisbee and an antelope .
Extra-place MAMLviaPP: oh that is hard work . why have you been staying there since ?

Persona

- i also love vintage cars
 - i love running and reading
 - my favorite music is jazz
 - i am a pediatrician
-

Dialogue History

USER: hi ! do you like dogs ? i have a great dane
SYSTEM: hey there how are you today ? yes i like dogs
USER: awesome ! i am good . what do you like to eat ?
SYSTEM: i like to eat vegetables an beans
USER: i really enjoy italian food . i hope to visit italy someday
SYSTEM: i like to run an i love a good reliable older car
USER: i prefer walking myself . i walk my big dog daily .
SYSTEM: sounds good i would love to go there but as a doctor i am busy
USER: oh wow . you could read about travel , that is what i do
SYSTEM: yes i would love to but i stay busy running an reading
USER: reading is my favorite ! i read about europe all the time

Generated Responses

Real Data: really what about ? i just relax to my wine an jazz
REINIT GPT-2: yes that is true , my daughter is about to middle school , where she likes to read and i like to listen to jazz !
Transfer Pre-trained GPT-2:
In-place MAMLviaPP: that sounds like fun i hope i can live closer to my parents
Extra-place MAMLviaPP: sounds like a great idea i love reading more than anything

Persona

- i am very conservative
 - my family lives down the street from me
 - i go to church every sunday
 - i drive a ford pickup truck
-

Dialogue History

USER: hi how are you today ?
SYSTEM: i am okay how are you today ?
USER: i am well . i just finished reading frost . i enjoy poetry !!!
SYSTEM: that is good where are you from ?
USER: i am from ca . i love hiking through nature out here . how about you ?
SYSTEM: ca nice i never been hiking before i live in upstate ny
USER: ooh ny must have interesting food . i love trying new types of good at least once .
SYSTEM: yes ny has lots of interesting foods what is your favorite type of food ?
USER: oops that is supposed to read i love trying new foods at least once .
SYSTEM: oh okay lol what do you do for work ?
USER: what do you enjoy about ny ?

Generated Responses

Real Data: i love the scenery the buildings are so tall
REINIT GPT-2: s i know i sell all types of cars .
Transfer Pre-trained GPT-2: i do not work i do not say i am doing that much
In-place MAMLviaPP: ny is an interesting city in my opin
Extra-place MAMLviaPP: i enjoy business life and i really enjoy having time to be with my family

Persona

- i love to ride my bike
 - i work as a nurses aide in a nursing home
 - i love caring for people
 - i have three grown children and six grandchildren
 - i have two dogs and one cat
-

Dialogue History

USER: good evening . how is your night going so far ?
SYSTEM: good evening . going good . there ?
USER: so far so good . just taking a break from studying .
SYSTEM: how old are you ? if you do not mind .
USER: i just turned 25 . i am in law school now . what about you ?

Generated Responses

Real Data: i am 24 . i finished college in may . now looking for a job .
REINIT GPT-2: i am 19 . very mature . i have two dogs and seven grandchildren
Transfer Pre-trained GPT-2: i just moved back home from working .
In-place MAMLviaPP: i am 20 years old . i love people how about you ?
Extra-place MAMLviaPP: i am training nurse assistant for my three grown children .
