

Supplementary Material for “Improving a Neural Semantic Parser by Counterfactual Learning from Human Bandit Feedback”

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A Empirical Validation of the NLMAPS Corpus Extension

To empirically validate the usefulness of the automatically created data, we compare two parsers trained with NEMATUS (Sennrich et al., 2017) (see Section 6 for more details). The first model is trained using the original NLMAPS training data. The second receives an additional 15,000 instances from the synthetic data. Both systems are tested on the original NLMAPS test data and on the new test set of NLMAPS v2 which consists of a random set of 2,000 pairs from the remaining data. Results may be found in Table 1. On the original test set, adding the 15,000 synthetic instances allows the parser to significantly improve by 2.09 in F1 score. The parser trained on the original training data performs badly on the new test set because it is ignorant of many OSM tags that were introduced with the extension.

		Train		
		v1	v1+15K	Δ
Test	v1	73.56±0.61	75.65±0.34	+2.09
	v2	28.31±0.25	79.17±0.11	+50.86

Table 1: Answer F1 scores on the NLMAPS v1 and NLMAPS v2 test sets for models trained on either only NLMAPS v1 training data or with an additional 15k synthetic instances. Results are averaged over 3 runs. Using the NLMAPS v2 training set leads to significant system differences on both test sets at $p < 0.05$.

B Automatic Feedback Form Creation

A query can be automatically converted into a set of statements which can be judged as correct or incorrect by non-expert users. There are 8 different statement types and each is triggered based

on the shape of the query and certain tokens. An overview of the statement types, their triggers and the value a statement will hold, can be found in Table 2.

C Screenshots of Human User Feedback.

Figures 1, 2, 3, 4 and 5 present screenshots of forms as filled out by the recruited human users.

References

Rico Sennrich, Orhan Firat, Kyunghyun Cho, Alexandra Birch, Barry Haddow, Julian Hirschler, Marcin Junczys-Dowmunt, Samuel Läubli, Antonio Valerio Miceli Barone, Jozef Mokry, and Maria Nadejde. 2017. Nematus: a toolkit for neural machine translation. In *Proceedings of the Software Demonstrations of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, Valencia, Spain.

Type	Explanation
Town	OSM tags of “ <i>area</i> ”
Reference Point	OSM tags “ <i>center</i> ”
POI(s)	OSM tags of “ <i>search</i> ” if “ <i>center</i> ” is set, else of “ <i>nwr</i> ”
Question Type	Arguments of “ <i>qtype</i> ”
Proximity : Around/Near	If “ <i>around</i> ” is present
Restriction : Closest	If “ <i>around</i> ” and “ <i>topx</i> ” are present
Distance	Argument of “ <i>maxdist</i> ”
Cardinal Direction	“ <i>north</i> ”, “ <i>east</i> ”, “ <i>south</i> ” or “ <i>west</i> ” are present

Table 2: Overview of the possible statements types that are used to transform a parse into a human-understandable block of statements.

Question #63: capacity Charging stations in Bordeaux

		Information found in Question?
Town	Bordeaux	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
POI(s)	amenity : charging station	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Question Type	Where	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Figure 1: Feedback form for question # as filled out by a human user.

Question #165: how many towns north of Heidelberg

		Information found in Question?
Town	Heidelberg	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
POI(s)	place : town	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Question Type	How many	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proximity	Around/Near	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Cardinal Direction	South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Distance	Around town distance	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Figure 2: Feedback form for question # as filled out by a human user.

Question #503: Is there Wayside Shrines near Nantes

		Information found in Question?
Reference Point	name : Nantes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
POI(s)	historic : wayside cross	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Question Type	Is there any	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proximity	Around/Near	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Figure 3: Feedback form for question # as filled out by a human user.

Question #692: artwork from the berlin bears

		Information found in Question?
Town	Berlin	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Reference Point	name : Hotel Bayerischer Hof	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
POI(s)	tourism : artwork	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Question Type	Where	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proximity	Around/Near	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Figure 4: Feedback form for question # as filled out by a human user.

Question #816: where amenities close to Haymarket in Edinburgh

		Information found in Question?
Town	Edinburgh	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Reference Point	name : High Street	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
POI(s)	amenity : bureau de change	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Question Type	Where	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proximity	Around/Near	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Figure 5: Feedback form for question # as filled out by a human user.