# Leveraging Subword Embeddings for Multinational Address Parsing

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## Introduction



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## Related Work



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# Subword Embeddings



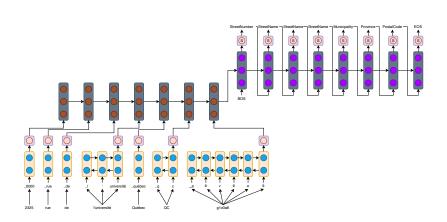
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## Architecture



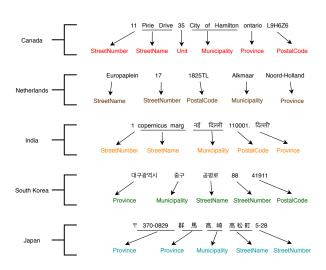




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#### About the Data





## Training Data



 $100\,\mathrm{K}$  of each country ...

## Holdout Test Set



Country	Number of samples	Country	Number of samples	Country	Number of samples	Country	Number of samples
United States	8,000,000	Germany	1,576,059	Poland	459,522	Czechia	195,269
Brazil	8,000,000	Spain	1,395,758	Norway	405,649	Italy	178,848
South Korea	6,048,106	Netherlands	1,202,173	Austria	335,800	France	20,050
Australia	5,428,043	Canada	910,891	Finland	280,219	United Kingdom	14,338
Mexico	4,853,349	Switzerland	474,240	Denmark	199,694	Russia	8115

## Zero-Shot Test Set



Country	Number of samples	Country	Number of samples	Country	Number of samples	Country	Number of samples
Belgium	66,182	Slovenia	9773	Réunion	2514	Singapore	968
Sweden	32,291	Ukraine	9554	Moldova	2376	Bangladesh	888
Argentina	27,692	Belarus	7590	Indonesia	2259	Paraguay	839
India	26,084	Serbia	6792	Bermuda	2065	Cyprus	836
Romania	19,420	Croatia	5671	Malaysia	2043	Bosnia	681
Slovakia	18,975	Greece	4974	South Africa	1388	Ireland	638
Hungary	17,460	New Zealand	4678	Latvia	1325	Algeria	601
Japan	14,089	Portugal	4637	Kazakhstan	1087	Colombia	569
Venezuela	10,696	Lithuania	3126	New Caledonia	1036	Uzbekistan	505
Philippines	10,471	Faroe Islands	2982	Estonia	1024		



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# **Experiments**



Country	FastText	BPEmb	Country	FastText	BPEmb
United States	$99.61 \pm 0.09$	$98.55 \pm 2.19$	Poland	$99.69 \pm 0.07$	$99.19 \pm 1.39$
Brazil	$99.40 \pm 0.10$	$98.54 \pm 1.68$	Norway	$99.46 \pm 0.06$	$97.98 \pm 1.31$
South Korea	$99.96 \pm 0.01$	$99.99 \pm 0.02$	Austria	$99.28 \pm 0.03$	$98.28 \pm 1.56$
Australia	$99.68 \pm 0.05$	$99.21 \pm 1.17$	Finland	$99.77 \pm 0.03$	$99.72 \pm 0.30$
Mexico	$99.60 \pm 0.06$	$98.55 \pm 2.22$	Denmark	$99.71 \pm 0.07$	$99.20 \pm 1.38$
Germany	$99.77 \pm 0.04$	$99.23 \pm 1.30$	Czechia	$99.57 \pm 0.09$	$98.77 \pm 2.22$
Spain	$99.75 \pm 0.05$	$98.65 \pm 2.36$	Italy	$99.73 \pm 0.05$	$98.91 \pm 1.76$
Netherlands	$99.61 \pm 0.07$	$99.26 \pm 1.23$	France	$99.66 \pm 0.08$	$98.65 \pm 2.00$
Canada	$99.79 \pm 0.05$	$99.19 \pm 1.33$	United Kingdom	$99.61 \pm 0.10$	$98.66 \pm 2.11$
Switzerland	$99.53 \pm 0.09$	$99.49 \pm 0.53$	Russia	$99.03 \pm 0.24$	$97.52 \pm 4.23$

# **Experiments**



Country	FastText	BPEmb	Country	FastText	BPEmb
Belgium	$88.14 \pm 1.04$	$87.45 \pm 1.37$	Faroe Islands	$74.14 \pm 1.83$	$86.59 \pm 2.21$
Sweden	$81.59 \pm 4.53$	$88.30 \pm 2.92$	Réunion	$96.80 \pm 0.45$	$92.42 \pm 2.38$
Argentina	$86.26 \pm 0.47$	$86.00 \pm 4.40$	Moldova	$90.18 \pm 0.79$	$78.11 \pm 16.79$
India	$69.09 \pm 1.74$	$\textbf{76.33} \pm \textbf{7.77}$	Indonesia	$64.31 \pm 0.84$	$69.25 \pm 2.81$
Romania	$94.49 \pm 1.52$	$90.52 \pm 2.35$	Bermuda	$92.31 \pm 0.60$	$92.65 \pm 1.84$
Slovakia	$82.10 \pm 0.98$	$89.40 \pm 5.09$	Malaysia	$78.93 \pm 3.78$	$92.76 \pm 2.55$
Hungary	$48.92 \pm 3.59$	$24.61 \pm 3.35$	South Africa	$95.31 \pm 1.68$	$92.75 \pm 7.43$
Japan	$\textbf{41.41} \pm \textbf{3.21}$	$33.34 \pm 3.83$	Latvia	$93.66 \pm 0.64$	$72.46 \pm 5.77$
Iceland	$96.55 \pm 1.20$	$97.61 \pm 0.98$	Kazakhstan	$86.33 \pm 3.06$	$88.28 \pm 11.32$
Venezuala	$94.87 \pm 0.53$	$89.82 \pm 5.74$	New Caledonia	$99.48 \pm 0.15$	$96.44 \pm 5.64$
Philippines	$77.76 \pm 3.97$	$78.00 \pm 11.75$	Estonia	$87.08 \pm 1.89$	$76.18 \pm 1.62$
Slovenia	$95.37 \pm 0.23$	$96.47 \pm 2.05$	Singapore	$86.42 \pm 2.36$	$83.23 \pm 6.38$
Ukraine	$92.99 \pm 0.70$	$90.86 \pm 2.90$	Bangladesh	$78.61 \pm 0.43$	$79.77 \pm 3.65$
Belarus	$91.08 \pm 3.08$	$90.16 \pm 11.89$	Paraguay	$96.01 \pm 1.23$	$96.22 \pm 1.78$
Serbia	$95.31 \pm 0.48$	$88.49 \pm 7.05$	Cyprus	$97.67 \pm 0.34$	$92.92 \pm 6.94$
Croatia	$94.59 \pm 2.21$	$88.17 \pm 4.58$	Bosnia	$84.04 \pm 1.47$	$80.53 \pm 6.56$
Greece	$81.98 \pm 0.60$	$35.30\pm13.51$	Ireland	$87.44 \pm 0.69$	$84.93 \pm 2.85$
New Zealand	$94.27 \pm 1.50$	$97.77 \pm 3.23$	Algeria	$85.37 \pm 2.05$	$79.66 \pm 11.68$
Portugal	$93.65 \pm 0.46$	$90.13 \pm 4.47$	Colombia	$87.81 \pm 0.92$	$87.60 \pm 3.61$
Bulgaria	$91.03 \pm 2.07$	$87.44 \pm 11.94$	Uzbekistan	$86.76 \pm 1.13$	$73.75 \pm 3.42$
Lithuania	$87.67 \pm 3.05$	$75.67 \pm 2.19$			



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## Conclusion

