Cross-topic Argument Mining from Heterogeneous Sources (Appendices)

Christian Stab[*] and **Tristan Miller**[*†] and **Benjamin Schiller**[*] and **Pranav Rai**[*] and **Iryna Gurevych**[*†]

[*]Ubiquitous Knowledge Processing Lab (UKP-TUDA)
Department of Computer Science, Technische Universität Darmstadt
https://www.ukp.tu-darmstadt.de/

[†]Research Training Group AIPHES
Department of Computer Science, Technische Universität Darmstadt
https://www.aiphes.tu-darmstadt.de/

A Hyperparameters for models after tuning

To find the best model configurations, we tuned the hyperparameters by training each model on the training data for all topics and evaluated their performance on all validation sets. In particular, we experimented with LSTM sizes of 32, 64, and 96; dropouts (Srivastava et al., 2014) of 0.3 and 0.7; batch sizes of 16, 64, and 96; and learning rates of 1×10^{-3} and 1×10^{-4}. Table 5 shows the best parameters for each of our neural networks on the validation data.

B Full results on test set

Tables 6 and 7 show detailed two- and three-label results for each of the eight topics: abortion (AB), cloning (CL), death penalty (DP), gun control (GC), marijuana legalization (ML), minimum wage (MW), nuclear energy (NE), and school uniforms (SU). The highest score in each column is set in boldface.

model(s)	LSTM size	dropout	batch size	learning rate
tr+bilstm+dip2016, tr+biclstm+dip2016, mtl+outer-att+dip2016, mtl+biclstm+semeval	96	0.7	16	1×10^{-3}
tr+outer-att+semeval	64	0.3	16	1×10^{-4}
mtl+biclstm+dip2016, mtl+outer-att+semeval	64	0.3	16	1×10^{-3}
bilstm, outer-att, biclstm, mtl+bilstm+semeval	64	0.7	16	1×10^{-3}
tr+bilstm+semeval	32	0.7	16	1×10^{-4}
tr+outer-att+dip2016, tr+biclstm+semeval, mtl+bilstm+dip2016	32	0.7	16	1×10^{-3}

Table 5: Hyperparameters for each model.

model	GC	NE	MW	AB	DP	CL	SU	ML
bilstm	.7116	.5722	.4789	.5763	.6664	.7057	.5368	.6074
lr-uni	.6110	.6080	.5495	.5132	.6229	.6532	.5426	.5829
outer-att	.5594	.5905	.4988	.6053	.6616	.7179	.7049	.6315
biclstm	.5811	.6348	.6945	.5948	.5945	.6626	.6356	.7332
trl+bilstm+semeval	**.7177**	.5848	.5618	.6443	.6738	.7207	.5390	.5959
trl+outer-att+semeval	.7113	.5829	.6093	.6325	**.6743**	.6934	.5448	.5860
trl+biclstm+semeval	.6253	.6162	.7078	.5758	.6010	.6999	.6423	.6782
trl+bilstm+dip2016	.6874	.5801	.5954	.5755	.6576	.6881	.5895	.6299
trl+outer-att+dip2016	.5507	.6033	.5828	.5829	.6520	.4578	.6978	.7323
trl+biclstm+dip2016	.5132	**.6618**	.5831	**.6707**	.6615	.3464	**.7215**	.7301
mtl+bilstm+semeval	.7135	.5800	.5386	.5495	.6595	.7088	.5423	.6086
mtl+outer-att+semeval	.7068	.5954	.5271	.5822	.6631	.7221	.5468	.6335
mtl+biclstm+semeval	.6136	.6455	**.7269**	.5600	.6095	.7084	.6601	.6911
mtl+bilstm+dip2016	.7136	.5716	.5126	.5816	.6696	.7146	.5349	.6173
mtl+outer-att+dip2016	.7089	.5972	.5137	.5848	.6710	**.7283**	.5763	.6298
mtl+biclstm+dip2016	.6545	.6542	.6970	.6239	.6149	.6820	.6582	**.7449**

Table 6: F_1 for each of the eight topics in two-label setup.

model	GC	NE	MW	AB	DP	CL	SU	ML
bilstm	.4154	.3621	.2863	.3718	.4360	.4602	.3452	.3598
lr-uni	.3733	.4146	.3177	.3305	.3971	.4727	.3596	.3911
outer-att	.4244	.3896	.2864	.3739	.4430	.4582	.3531	.3701
biclstm	.3561	.4336	**.4593**	.3641	.4089	.4618	.4480	**.4613**
trl+bilstm+semeval	.4106	.3414	.2827	**.4071**	.4184	**.4812**	.2978	.3194
trl+outer-att+semeval	**.4273**	.3964	.3018	.3997	**.4502**	.4752	.3337	.3122
trl+biclstm+semeval	.3564	.4204	.3910	.3373	.4028	.4513	.4250	.3779
trl+bilstm+dip2016	.3601	.3603	.2934	.3642	.4063	.4190	.3344	.3650
trl+outer-att+dip2016	.3457	.3738	.3047	.3437	.3958	.3348	.3341	.3182
trl+biclstm+dip2016	.3168	.4091	.3970	.3716	.3928	.2648	.3444	.3795
mtl+bilstm+semeval	.4150	.3576	.3017	.3679	.4288	.4649	.3318	.3445
mtl+outer-att+semeval	.3491	.3768	.2897	.3665	.4335	.4471	.3959	.3530
mtl+biclstm+semeval	.3448	.4287	.4184	.3695	.4023	.4586	**.4768**	.4183
mtl+bilstm+dip2016	.4055	.3562	.2928	.3613	.4366	.4565	.3469	.3495
mtl+outer-att+dip2016	.4102	.3780	.2778	.3664	.4350	.4684	.3603	.3775
mtl+biclstm+dip2016	.3758	**.4385**	.4379	.4003	.4083	.4539	.4528	.4604

Table 7: F_1 for each of the eight topics in three-label setup.