

Experiments

Ablation Study

- Observed that adding Dual Emotion Features into detectors **all obtain the highest macro F1 scores**.
- Exhibits that adopting **Social Emotion** or **Emotion Gap** improves the macro F1 scores more **than Publisher Emotion on any models**.
- Concludes that Social Emotion and Emotion Gap **matter more** when detecting fake news.

Models		R-19	W-16	W-20	W-20(t)
BiGRU+	Publisher Emotion	0.310	0.809	0.842	0.681
	Social Emotion	0.322	0.818	0.847	0.693
	Emotion Gap	0.336	0.811	0.849	0.693
	Dual Emotion Features	0.340	0.826	0.855	0.701
BERT+	Publisher Emotion	0.312	0.850	0.889	0.705
	Social Emotion	0.339	0.856	0.911	0.730
	Emotion Gap	0.338	0.858	0.906	0.731
	Dual Emotion Features	0.346	0.867	0.915	0.734
Nile TMRG+	Publisher Emotion	0.311	-	-	-
	Social Emotion	0.325	-	-	-
	Emotion Gap	0.337	-	-	-
	Dual Emotion Features	0.342	-	-	-
HSA-BLSTM+	Publisher Emotion	-	0.876	0.915	0.779
	Social Emotion	-	0.892	0.922	0.792
	Emotion Gap	-	0.901	0.926	0.800
	Dual Emotion Features	-	0.908	0.932	0.805

Table 8: Ablation study of the three components of *Dual Emotion Features*. The evaluation metric is macro F1 scores. R-19: RumourEval-19, W-16: Weibo-16, W-20: Weibo-20, and W-20(t): temporally split Weibo-20.

Experiments

Case Study

<div><div>Content</div><div>Publisher emotion: <i>Angry</i></div><div>Black Lives Matter THUGS Blocking Emergency Crews From Reaching Hurricane Victims.</div></div> <div><div>Comments</div><div>Social emotion: <i>Angry</i></div><div><div>Run over their asses.</div><div>...</div><div>When thugs block emergency vehicles, vehicles should run over the thugs</div><div>...</div><div>And why don't we have military support there to enforce the law?</div></div></div> <table><tr><td></td><td>Fake</td><td>Real</td><td>Unverified</td></tr><tr><td>BiGRU</td><td>0.33</td><td>0.61</td><td>0.06</td></tr><tr><td>BiGRU + Emoratio</td><td>0.35</td><td>0.57</td><td>0.08</td></tr><tr><td>BiGRU + EmoCred</td><td>0.27</td><td>0.64</td><td>0.09</td></tr><tr><td>BiGRU + Dual Emotion Features</td><td>0.65</td><td>0.21</td><td>0.14</td></tr></table>		Fake	Real	Unverified	BiGRU	0.33	0.61	0.06	BiGRU + Emoratio	0.35	0.57	0.08	BiGRU + EmoCred	0.27	0.64	0.09	BiGRU + Dual Emotion Features	0.65	0.21	0.14	<div><div>Content</div><div>Publisher emotion: <i>Joyful</i></div><div>Believe it or not, this is a shark on the freeway in #Houston, #Texas #HurricaneHarvy...</div></div> <div><div>Comments</div><div>Social emotion: <i>Joyful</i></div><div><div>Fresh water? Nice try.</div><div>...</div><div>Oh my!</div><div>...</div><div>It's trying to ask you for directions...must be a female shark!! 😊</div></div></div> <table><tr><td></td><td>Fake</td><td>Real</td><td>Unverified</td></tr><tr><td>BiGRU</td><td>0.31</td><td>0.50</td><td>0.19</td></tr><tr><td>BiGRU + Emoratio</td><td>0.36</td><td>0.56</td><td>0.08</td></tr><tr><td>BiGRU + EmoCred</td><td>0.40</td><td>0.54</td><td>0.06</td></tr><tr><td>BiGRU + Dual Emotion Features</td><td>0.65</td><td>0.22</td><td>0.13</td></tr></table>		Fake	Real	Unverified	BiGRU	0.31	0.50	0.19	BiGRU + Emoratio	0.36	0.56	0.08	BiGRU + EmoCred	0.40	0.54	0.06	BiGRU + Dual Emotion Features	0.65	0.22	0.13	<div><div>Content</div><div>Publisher emotion: <i>None</i></div><div>Category 6? If Hurricane Irma Becomes The Strongest Hurricane In History, It Could Wipe Entire Cities Off The Map.</div></div> <div><div>Comments</div><div>Social emotion: <i>Sad</i></div><div><div>Watch what the power of prayer does</div><div>...</div><div>Get out of there people. Florida, South Carolina.</div><div>...</div><div>Pray to god the only chance you have...</div></div></div> <table><tr><td></td><td>Fake</td><td>Real</td><td>Unverified</td></tr><tr><td>BiGRU</td><td>0.47</td><td>0.52</td><td>0.01</td></tr><tr><td>BiGRU + Emoratio</td><td>0.40</td><td>0.59</td><td>0.01</td></tr><tr><td>BiGRU + EmoCred</td><td>0.28</td><td>0.58</td><td>0.14</td></tr><tr><td>BiGRU + Dual Emotion Features</td><td>0.63</td><td>0.17</td><td>0.20</td></tr></table>		Fake	Real	Unverified	BiGRU	0.47	0.52	0.01	BiGRU + Emoratio	0.40	0.59	0.01	BiGRU + EmoCred	0.28	0.58	0.14	BiGRU + Dual Emotion Features	0.63	0.17	0.20
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- It exhibits using Emoratio & EmoCred **do not help** BiGRU detect rightly for the three cases.
- It reveals that mining dual emotion additionally sometimes **is a remedy for incompetence** of only using semantics for detecting fake news.