Experiments
Baselines

- DTC (2011): Decision Tree classifier based on various handcrafted features

- SVM-RBF (2012): SVM-based model with RBF kernel, using handcrafted features

- SVM-TS (2015): linear SVM classifier that leverages handcrafted features to construct time-series model

- SVM-TK (2017): SVM classifier with a propagation Tree Kernel on the basis of the propagation structures

- RvNN (2018): tree-structured recursive neural networks with GRU units that learn rumor representations via the propagation structure

- PPC_RNN+CNN (2018): combining RNN and CNN, which learns the rumor representations through the characteristics of users in the rumor propagation path

Experiments
Overall Performance

Weibo

Method	Class	Acc.	Prec.	Rec.	F_1
DTC	F	0.831	0.847	0.815	0.831
	T		0.815	0.824	0.819
SVM-RBF	F	0.879	0.777	0.656	0.708
	T		0.579	0.708	0.615
SVM-TS	F	0.885	0.950	0.932	0.938
	T		0.124	0.047	0.059
RvNN	F	0.908	0.912	0.897	0.905
	T		0.904	0.918	0.911
PPC_RNN+CNN	F	0.916	0.884	0.957	0.919
	T		0.955	0.876	0.913
Bi-GCN	F	**0.961**	**0.961**	**0.964**	**0.961**
	T		**0.962**	**0.962**	**0.960**

Twitter15

Method	Acc.	N F_1	F F_1	T F_1	U F_1
DTC	0.454	0.415	0.355	0.733	0.317
SVM-RBF	0.318	0.225	0.082	0.455	0.218
SVM-TS	0.544	0.796	0.472	0.404	0.483
SVM-TK	0.750	0.804	0.698	0.765	0.733
RvNN	0.723	0.682	0.758	0.821	0.654
PPC_RNN+CNN	0.477	0.359	0.507	0.300	0.640
Bi-GCN	**0.886**	**0.891**	**0.860**	**0.930**	**0.864**

Twitter16

Method	Acc.	N F_1	F F_1	T F_1	U F_1
DTC	0.473	0.254	0.080	0.190	0.482
SVM-RBF	0.553	0.670	0.085	0.117	0.361
SVM-TS	0.574	0.755	0.420	0.571	0.526
SVM-TK	0.732	0.740	0.709	0.836	0.686
RvNN	0.737	0.662	0.743	0.835	0.708
PPC_RNN+CNN	0.564	0.591	0.543	0.394	0.674
Bi-GCN	**0.880**	**0.847**	**0.869**	**0.937**	**0.865**

- Observe that the deep learning methods performs significantly better than those using hand-crafted features.

- Demonstrates the importance and necessity of studying deep learning for rumor detection.