# 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 | T | U |
|---|---|---|---|---|---|
| | | $F_1$ | $F_1$ | $F_1$ | $F_1$ |
| 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 | T | U |
|---|---|---|---|---|---|
| | | $F_1$ | $F_1$ | $F_1$ | $F_1$ |
| 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.

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**Twitter15**

| Method | Acc. | N | F | T | U |
|---|---|---|---|---|---|
| | | $F_1$ | $F_1$ | $F_1$ | $F_1$ |
| 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 | T | U |
|---|---|---|---|---|---|
| | | $F_1$ | $F_1$ | $F_1$ | $F_1$ |
| 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 |
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- Bi-GCN outperforms PPC_RNN+CNN in terms of all the performance measures, indicates the effectiveness of incorporating the dispersion structure for rumor detection.
- Since RNN & CNN can't process data with the graph structure, so ignore important structure features of dispersion.