TABLE 1. the Top-K precision for each network by each link prediction method. For small networks, i.e. Mexican, Dolphin, Bomb, Lesmis, Throne and CS, we use Top-10 precision. For Jazz, Email and Geom, we use Top-100 precision. HP (RA) means HP is based on RA

and EDA (RA) means that the fitness of EDA is based on RA as well.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mexican | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.16 | 0.136 | 0.132 | 0.01 | **0** |
| CN | 0.13 | 0.104 | 0.108 | 0.03 | **0** |
| Jaccard | 0.1 | 0.0969 | 0.0759 | 0.03 | **0** |
| PA | 0.06 | 0.0749 | 0.0606 | 0.04 | **0.0311** |
| AA | 0.14 | 0.125 | 0.123 | 0.02 | **0** |
| LP | 0.11 | 0.101 | 0.108 | 0.05 | **0.0181** |
| DeepWalk | 0.04 | 0.0549 | 0.0472 | 0.03 | **0.0203** |
| HOPE | 0.09 | 0.0899 | 0.0637 | 0.02 | **0.00213** |
| Dolphin | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.14 | 0.101 | 0.103 | **0** | **0** |
| CN | 0.16 | 0.107 | 0.114 | 0.02 | **0** |
| Jaccard | 0.11 | 0.0839 | 0.0902 | 0.01 | **0.00297** |
| PA | 0.01 | 0.0098 | 0.01 | **0** | **0** |
| AA | 0.13 | 0.1111 | 0.112 | **0** | **0** |
| LP | 0.15 | 0.12 | 0.118 | 0.05 | **0.0222** |
| deepwalk | 0.06 | 0.0458 | 0.0396 | 0.03 | **0.0129** |
| hope | 0.06 | 0.0523 | 0.0456 | **0** | 0.00297 |
| Bomb | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.92 | 0.412 | 0.457 | 0.07 | **0** |
| CN | 0.92 | 0.515 | 0.624 | **0.08** | 0.119 |
| Jaccard | 0.69 | 0.410 | 0.402 | 0.38 | **0.267** |
| PA | 0.31 | 0.244 | 0.279 | **0.09** | 0.156 |
| AA | 0.92 | 0.505 | 0.603 | 0.07 | **0.0530** |
| LP | 0.85 | 0.505 | 0.581 | **0.23** | 0.253 |
| DeepWalk | 0.22 | 0.167 | 0.136 | 0.25 | **0.163** |
| HOPE | 0.51 | 0.363 | 0.273 | 0.3 | **0.242** |
| Lesmis | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.76 | 0.432 | 0.455 | 0.1 | **0** |
| CN | 0.59 | 0.428 | 0.459 | 0.3 | **0.0610** |
| Jaccard | 0.02 | 0.0409 | **0.005** | 0.03 | 0.0785 |
| PA | 0.1 | 0.102 | 0.101 | **0.09** | 0.0966 |
| AA | 0.72 | 0.442 | 0.470 | 0.16 | **0.0785** |
| LP | 0.6 | 0.416 | 0.419 | 0.44 | **0.171** |
| DeepWalk | 0.06 | 0.0953 | **0.0339** | 0.09 | 0.127 |
| HOPE | 0.02 | 0.0201 | **0.0047** | 0.02 | 0.0367 |
| Throne | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.48 | 0.316 | 0.350 | 0.06 | **0.0366** |
| CN | 0.34 | 0.279 | 0.293 | 0.12 | **0.0833** |
| Jaccard | 0.02 | 0.0549 | **0.0337** | 0.04 | 0.0366 |
| PA | 0.18 | 0.147 | 0.171 | **0.1** | 0.12 |
| AA | 0.4 | 0.309 | 0.337 | 0.09 | **0.0516** |
| LP | 0.28 | 0.227 | 0.243 | **0.09** | 0.143 |
| DeepWalk | 0.03 | 0.0244 | **0.0158** | 0.03 | 0.0183 |
| HOPE | 0.01 | 0.0327 | **0.015** | 0.03 | 0.0233 |
| Jazz | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.808 | 0.471 | 0.498 | **0.097** | 0.410 |
| CN | 0.81 | 0.475 | 0.508 | **0.191** | 0.421 |
| Jaccard | 0.752 | 0.460 | 0.488 | **0.317** | 0.421 |
| PA | 0.194 | 0.171 | 0.190 | **0.109** | 0.162 |
| AA | 0.837 | 0.478 | 0.514 | **0.16** | 0.424 |
| LP | 0.598 | 0.401 | 0.393 | **0.288** | 0.346 |
| DeepWalk | 0.389 | 0.288 | 0.235 | **0.225** | 0.329 |
| HOPE | 0.361 | 0.315 | **0.293** | 0.3 | 0.346 |
| CS | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.5 | 0.251 | 0.252 | **0** | 0.1 |
| CN | 0.2 | 0.177 | 0.179 | **0.1** | 0.133 |
| Jaccard | 0.3 | 0.211 | 0.22 | **0.2** | **0.2** |
| PA | 0 | 0.001 | **0** | **0** | **0** |
| AA | 0.2 | 0.168 | 0.177 | **0** | 0.1 |
| LP | 0 | 0.029 | 0.034 | **0** | **0** |
| DeepWalk | 0.2 | 0.171 | 0.136 | 0.2 | **0.133** |
| HOPE | 0.2 | 0.199 | 0.167 | 0.2 | **0.166** |
| Email | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.059 | 0.0524 | 0.0532 | **0.012** | 0.032 |
| CN | 0.055 | 0.052 | 0.0521 | **0.032** | 0.044 |
| Jaccard | 0.009 | 0.0062 | 0.0062 | 0.007 | **0.00533** |
| PA | 0.003 | **0.0021** | 0.003 | 0.007 | 0.003 |
| AA | 0.058 | 0.0549 | 0.0563 | **0.02** | 0.0426 |
| LP | 0.031 | 0.0298 | 0.0296 | **0.024** | 0.0286 |
| DeepWalk | 0.014 | 0.0109 | 0.0118 | 0.014 | **0.0103** |
| HOPE | 0.002 | 0.0032 | 0.0025 | **0.002** | **0.002** |
| Geom | original | RLR | RLS | HP(RA) | EDA(RA) |
| RA | 0.297 | 0.264 | 0.274 | **0.006** | 0.232 |
| CN | 0.082 | 0.0811 | 0.0813 | **0.073** | 0.0807 |
| Jaccard | 0.019 | 0.0167 | 0.0179 | 0.022 | **0.0131** |
| PA | 0.015 | **0.013** | 0.015 | 0.015 | 0.0145 |
| AA | 0.149 | 0.134 | 0.137 | **0.058** | 0.122 |
| LP | 0.049 | 0.0475 | 0.0488 | **0.045** | 0.0483 |
| DeepWalk | 0.085 | 0.0724 | 0.0708 | 0.082 | **0.0441** |
| HOPE | 0.0130 | **0.0107** | 0.0114 | 0.0130 | 0.0110 |