Table 1. A brief description of the datasets.

|  |  |  |  |
| --- | --- | --- | --- |
| Name of dataset | Total No. of records | No. of attributes | No. of classes |
| Glass Identification (GI) | 214 | 10 | 6 |
| Wdbc | 569 | 30 | 2 |
| Flame | 240 | 2 | 2 |
| Compound | 399 | 2 | 6 |
| Pathbased | 300 | 2 | 3 |
| Jain | 373 | 2 | 2 |
| S1 | 1000 | 2 | 15 |
| S3 | 1000 | 2 | 15 |
| Dim064 | 1024 | 64 | 16 |
| Dim256 | 1024 | 256 | 16 |

Table 2. Mean and standard deviation of ARI (higher the better) measured on the outputs of GenClust++ and MGenClust++ (over 30 independent runs).

|  |  |  |
| --- | --- | --- |
| Dataset | GenClust++ | MGenClust++ |
| Glass Identification | 0.27 ± 0.0831 | **0.5562** ± 0.1753 |
| Wdbc | **0.7616** ± 0.0019 | 0.707 ± 0.0242 |
| Flame | 0.3997 ± 0.0811 | **0.4585** ± 0.0403 |
| Compound | 0.7164 ± 4.0E-4 | **0.7192** ± 0.0137 |
| Pathbased | 0.2972 ± 0.0661 | **0.4466** ± 0.0293 |
| Jain | 0.1425 ± 0.0229 | **0.5767** ± 0.0 |
| S1 | 0.8678 ± 0.1031 | **0.9244** ± 0.0292 |
| S3 | 0.6212 ± 0.0638 | **0.6361** ± 0.0161 |
| DIM064 | 0.9813 ± 0.0361 | **0.9849** ± 0.0136 |
| DIM256 | 0.9979 ± 0.0115 | **0.9987** ± 0.0037 |

Table 3. Mean and standard deviation of DB Index (lower the better) measured on the outputs of GenClust++ and MGenClust++ (over 30 independent runs).

|  |  |  |
| --- | --- | --- |
| Dataset | GenClust++ | MGenClust++ |
| Glass Identification | 1.2986 ± 1.0282 | **0.5103** ± 0.0028 |
| Wdbc | 1.1263 ± 8.0E-4 | **1.1241** ± 0.0632 |
| Flame | **0.7202** ± 0.0264 | 0.8544 ± 0.1249 |
| Compound | **0.5525** ± 0.0014 | 0.5602 ± 0.0178 |
| Pathbased | 0.7461 ± 0.0321 | **0.7148** ± 0.0398 |
| Jain | **0.6971** ± 0.0149 | 0.782 ± 0.0 |
| S1 | **0.4517** ± 0.065 | 0.5957 ± 0.0551 |
| S3 | **0.6884** ± 0.0221 | 0.7955 ± 0.0438 |
| DIM064 | **0.1675** ± 0.2123 | 0.6502 ± 0.4075 |
| DIM256 | **0.0427** ± 0.0942 | 0.1067 ± 0.193 |

Table 4. Mean and standard deviation of Silhouette coefficient (higher the better) measured on the outputs of GenClust++ and MGenClust++ (over 30 independent runs).

|  |  |  |
| --- | --- | --- |
| Dataset | GenClust++ | MGenClust++ |
| Glass Identification | 0.2657 ± 0.1435 | **0.575** ± 0.0208 |
| Wdbc | 0.3812 ± 3.0E-4 | **0.3889** ± 0.0111 |
| Flame | **0.4341** ± 0.027 | 0.4051 ± 0.0157 |
| Compound | **0.6045** ± 2.0E-4 | 0.6019 ± 0.0081 |
| Pathbased | 0.3795 ± 0.0252 | **0.5117** ± 0.0287 |
| Jain | 0.4489 ± 0.0146 | **0.509** ± 0.0 |
| S1 | **0.653** ± 0.0484 | 0.6273 ± 0.0256 |
| S3 | **0.4615** ± 0.0201 | 0.442 ± 0.0168 |
| DIM064 | **0.9475** ± 0.035 | 0.869 ± 0.0606 |
| DIM256 | **0.9806** ± 0.0111 | 0.9694 ± 0.0323 |

Table 5. Mean and standard deviation of the average number of clusters (over 30 independent runs) for GenClust++ and MGenClust++

|  |  |  |
| --- | --- | --- |
| Dataset | GenClust++ | MGenClust++ |
| Glass Identification (GI) | 3.1667 ± 2.4642 | **3.3333** ± 0.6992 |
| Wdbc | **2.0** ± 0.0 | 2.0333 ± 0.1795 |
| Flame | 4.8 ± 2.3007 | **2.8333** ± 0.4534 |
| Compound | 3.0 ± 0.0 | **3.0667** ± 0.2494 |
| Pathbased | 13.3 ± 2.3402 | **3.0667** ± 0.7717 |
| Jain | 10.4 ± 1.8903 | **2.0** ± 0.0 |
| S1 | **13.2333** ± 1.82 | 20.5667 ± 1.5424 |
| S3 | **12.7333** ± 2.0806 | 23.5667 ± 1.4302 |
| DIM064 | **15.7** ± 0.5859 | 18.9 ± 2.3714 |
| DIM256 | **15.9667** ± 0.1795 | 16.2667 ± 0.6799 |

Fig. 1. Comparative average results between GenClust++ and MGenClust++ on 10 datasets based on ARI, DB Index and Silhouette Coefficient