科學試算_HW4:High imensional Data Visualization

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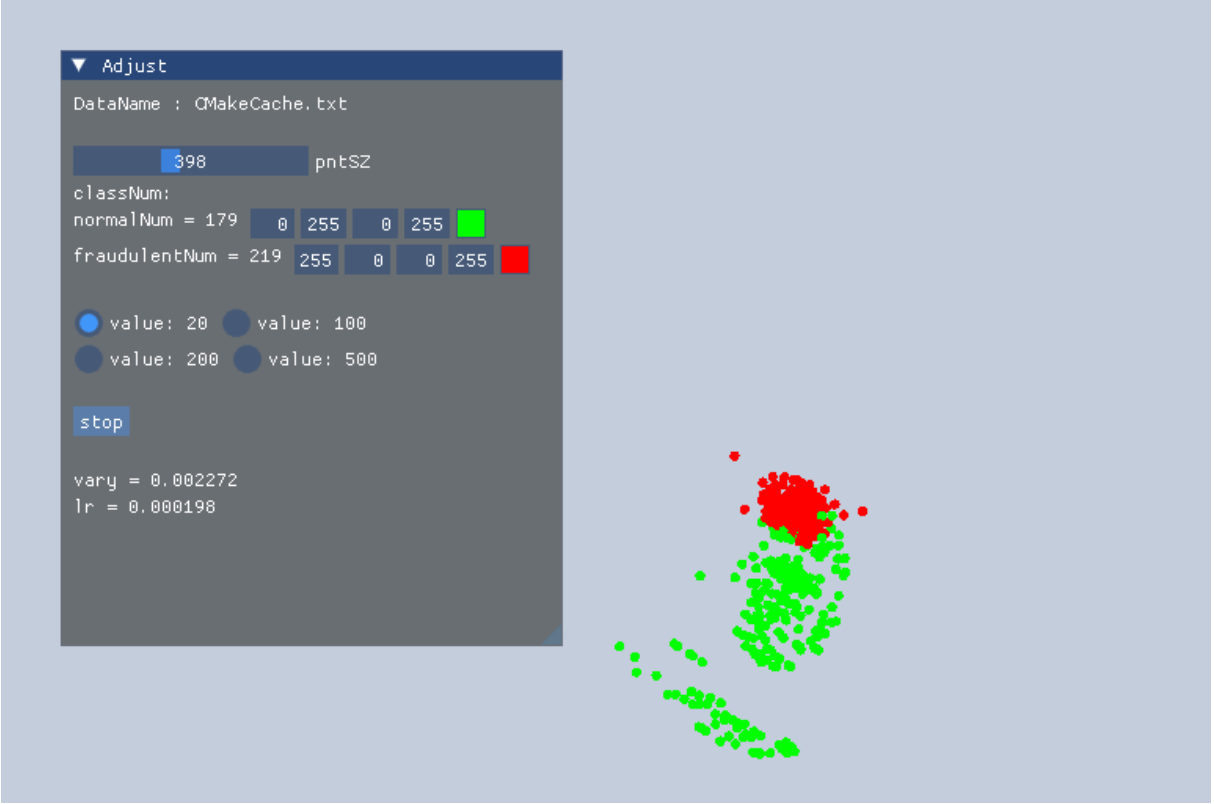


完成項目：

- Random select N items

```
for(int i = 0; i < drawSZ; ++i){
    pnt[i].resize(drawSZ);
    for(int j = 0; j < drawSZ; ++j){
        pnt[i][j].x = 1.0 * i / drawSZ;
        pnt[i][j].y = 1.0 * (drawSZ - j) / drawSZ;
```

- Sammon Method

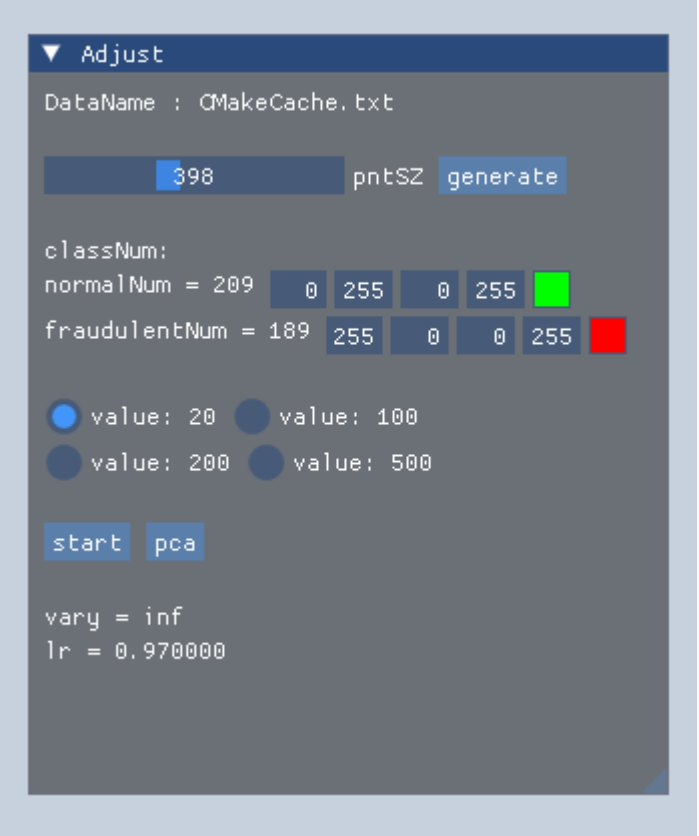
```
double tmpX = samPos[i].X - samPos[j].X;
double tmpY = samPos[i].Y - samPos[j].Y;
double tmp = sqrt(tmpX * tmpX + tmpY * tmpY);
if (tmp < delta) tmp = delta;
newE += powf(tarDis[i][j] - tmp, 2) / tarDis[i][j];
double factor = lr * (1 - tarDis[i][j] / tmp) / tmp;
grid[i].X -= factor * tmpX;
grid[i].Y -= factor * tmpY;
grid[j].X += factor * tmpX;
grid[j].Y += factor * tmpY;
```

- PCA

```cpp
vector<vector<double>> mat(attSZ - 1, vector<double>(attSZ - 1, 0.0f));
for(int i = 0; i < attSZ - 1; ++i){
    for(int j = 0; j < pntSZ; ++j){
        for(int k = 0; k < attSZ - 1; ++k){
            mat[i][k] += (pntAtt[j][i] * pntAtt[j][k]) / (attSZ - 1);
        }
    }
}
pair<int, int> priAxis = jacobi(mat, attSZ - 1, 0);
```

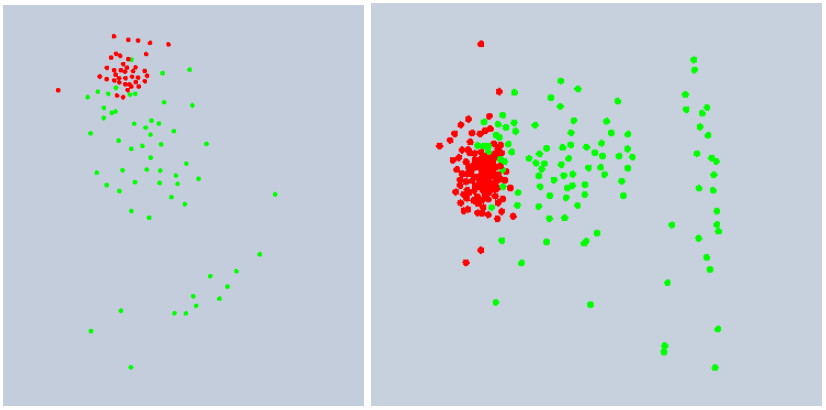
功能（可互動項目）：

- 調整選擇點數
- 正常與不正常顏色調整
- Train 時 lr 的迭代頻率
- 切換Texture
- Training 的部份調整

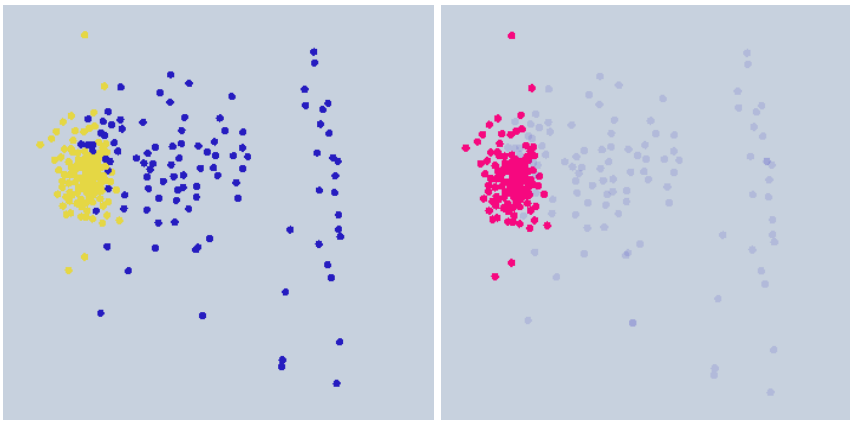


成果展示：

- 不同數量的 sammon



- 顏色調整



- sammon(20) vs PCA