zg21696\_SectionC\_code

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## Importing Data and pretreatment

## [1] 569 31

## symmetry\_mean area\_mean  
## 1 0.2419 1001  
## 2 0.1812 1326  
## 3 0.2069 1203

## Hyperparameter Tuning through RandomizedSearchCV

In this part, an external package named RandomSearchR by MOUSELIMIS is used for implementing RandomizedSearchCV to tune hyperparameter.

##   
## grid random search starts ..   
##   
## | | | 0% | |== | 3% | |===== | 7% | |======= | 10% | |========== | 14% | |============ | 17% | |============== | 21% | |================= | 24% | |=================== | 28% | |====================== | 31% | |======================== | 34% | |=========================== | 38% | |============================= | 41% | |=============================== | 45% | |================================== | 48% | |==================================== | 52% | |======================================= | 55% | |========================================= | 59% | |=========================================== | 62% | |============================================== | 66% | |================================================ | 69% | |=================================================== | 72% | |===================================================== | 76% | |======================================================== | 79% | |========================================================== | 83% | |============================================================ | 86% | |=============================================================== | 90% | |================================================================= | 93% | |==================================================================== | 97% | |======================================================================| 100%

## $kknn  
## k distance kernel Min. 1st Qu. Median Mean 3rd Qu.  
## 10 8 3 gaussian 0.9294118 0.9647059 0.9651163 0.9694938 0.9882353  
## 21 8 3 gaussian 0.9294118 0.9647059 0.9651163 0.9694938 0.9882353  
## 1 20 5 cos 0.8941176 0.9534884 0.9647059 0.9554036 0.9764706  
## 2 6 1 triangular 0.9411765 0.9418605 0.9647059 0.9648427 0.9764706  
## 4 7 2 inv 0.9294118 0.9534884 0.9647059 0.9624624 0.9647059  
## 5 13 3 epanechnikov 0.9294118 0.9534884 0.9647059 0.9624624 0.9764706  
## 7 12 5 gaussian 0.8941176 0.9534884 0.9647059 0.9530506 0.9647059  
## 11 13 1 optimal 0.9294118 0.9418605 0.9647059 0.9601368 0.9764706  
## 12 4 1 rectangular 0.9411765 0.9534884 0.9647059 0.9695212 0.9882353  
## 13 4 2 inv 0.9294118 0.9418605 0.9647059 0.9577839 0.9647059  
## 16 7 2 triangular 0.9411765 0.9534884 0.9647059 0.9648153 0.9647059  
## 19 12 1 triangular 0.9294118 0.9418605 0.9647059 0.9601368 0.9764706  
## 23 8 1 gaussian 0.9294118 0.9418605 0.9647059 0.9577839 0.9764706  
## 24 10 1 inv 0.9294118 0.9418605 0.9647059 0.9577839 0.9647059  
## 26 9 5 gaussian 0.8941176 0.9534884 0.9647059 0.9554036 0.9764706  
## 27 10 3 epanechnikov 0.9294118 0.9534884 0.9647059 0.9648153 0.9764706  
## 28 7 2 cos 0.9411765 0.9534884 0.9647059 0.9648153 0.9647059  
## 30 7 4 optimal 0.9058824 0.9418605 0.9647059 0.9530780 0.9647059  
## 8 12 3 inv 0.9176471 0.9529412 0.9534884 0.9601094 0.9882353  
## 17 3 3 gaussian 0.9058824 0.9411765 0.9534884 0.9506977 0.9647059  
## 25 9 3 gaussian 0.9176471 0.9529412 0.9534884 0.9601094 0.9882353  
## 3 17 1 rectangular 0.9176471 0.9302326 0.9529412 0.9531053 0.9764706  
## 15 11 1 biweight 0.9302326 0.9411765 0.9529412 0.9554583 0.9647059  
## 18 20 1 inv 0.9176471 0.9302326 0.9529412 0.9531053 0.9764706  
## 20 12 3 triweight 0.9176471 0.9411765 0.9529412 0.9483447 0.9534884  
## 29 19 1 rank 0.9058824 0.9302326 0.9529412 0.9531053 0.9882353  
## 6 4 3 rank 0.9176471 0.9411765 0.9418605 0.9530780 0.9764706  
## 9 4 4 inv 0.9058824 0.9411765 0.9418605 0.9483721 0.9647059  
## 14 5 5 optimal 0.9176471 0.9176471 0.9411765 0.9366074 0.9418605  
## 22 3 3 rank 0.9058824 0.9176471 0.9411765 0.9366074 0.9418605  
## Max.  
## 10 1.0000000  
## 21 1.0000000  
## 1 0.9882353  
## 2 1.0000000  
## 4 1.0000000  
## 5 0.9882353  
## 7 0.9882353  
## 11 0.9882353  
## 12 1.0000000  
## 13 0.9882353  
## 16 1.0000000  
## 19 0.9882353  
## 23 0.9764706  
## 24 0.9882353  
## 26 0.9882353  
## 27 1.0000000  
## 28 1.0000000  
## 30 0.9882353  
## 8 0.9882353  
## 17 0.9882353  
## 25 0.9882353  
## 3 0.9882353  
## 15 0.9882353  
## 18 0.9882353  
## 20 0.9764706  
## 29 0.9882353  
## 6 0.9882353  
## 9 0.9882353  
## 14 0.9647059  
## 22 0.9764706

## $kknn  
## $kknn$k  
## [1] 8 8 20 6 7  
##   
## $kknn$distance  
## [1] 3 3 5 1 2  
##   
## $kknn$kernel  
## [1] "gaussian" "gaussian" "cos" "triangular" "inv"