Pseudo-code of the model Tree Induction Algoritm (TRIAL)

```
FUNCTION: TRIAL

Initialise ModelTree structure

Flag root node as open node

WHILE GrowTree = true
  Find open leaf nodes

  FOR EACH open leaf node
    Find best split for open leaf node

    Flag node as closed node
  ENDFOR

  Calculate new tree BIC for each leaf node split

  Find best node to split: min(NewTreeBIC)

  IF NewTreeBIC < CurrentTreeBIC
    Split node

    Flag new children leaf nodes as open nodes
  ENDIF ELSE
    GrowTree = false
  ENDELSE
ENDWHILE

RETURN: ModelTree

END
```

Pseudo-code of the function that determines the best split for continuous variables

```
FUNCTION FindBestContinousVariableSplit

FOR EACH continous split variable
  FOR EACH split location

    LeftMembers= WHERE(CurrentSplitVariable < CurrentValue)

    RightMembers= WHERE(CurrentSplitVariable >= CurrentValue)

    IF (nsamplesLeft >= MinSamples) AND (nsamplesRight >= MinSamples)
      Compute multiple regression for left and right child

      Compute the sum of left and right SSE
    ENDIF
  ENDFOR
ENDFOR

Find best variable and location: min(SSE)

Estimate coefficients for left and right children using stepwise variable
forward selection; selection criterion: significance and reduction of BIC

Estimate unbiased sum of squared errors for left and right child using
crossvalidation

RETURN: Best continuous split, coefficients, crossvalidated errors for left
and right child

END
```

Pseudo-code of the function that determines the best split for categorical variables

```
FUNCTION: FindBestCategorialSplit

FOR EACH categorical variable

  REPEAT UNTIL two categories are left
    Find best combination of two categories in sharing the same multiple
    regression: min(SSE)

    Merge these two categories
  ENDREPEAT
ENDFOR

Select the variable where splitting results in largest error reduction:
min(SSE)

Estimate coefficients for left and right children using stepwise variable
forward selection; selection criterion: significance and reduction of BIC

Estimate unbiased sum of squared errors for left and right child using
crossvalidation

RETURN: Best categorical split, coefficients, and crossvalidated errors for
left and right child

END
```

Pseudo-code of the model tree ensemble method (Evolving tRees with RandOm gRowth ERROR)

```
PROCEDURE: ERROR

Grow deterministic tree with TRIAL

REPEAT UNTIL forest complete
  Choose an existing tree that will be modified: Min(random * TreeBIC_rank)

  load tree from working directory

  Choose a random interior node with more than two leaf nodes that will be
  Pruned

  prune tree at this node

  grow tree randomly from this node

  grow tree deterministically from the new leaf nodes

  IF not all final split nodes are deterministic
    prune tree at final random split nodes

    make deterministic splits at final split nodes
  ENDIF

  save tree in working directory and store the BIC of the tree
ENDREPEAT

Select diverse trees for the ensemble

END
```