**A study of the transferability of influenza case detection systems between two large healthcare systems**

**–supplementary material–**

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# **S1 Text. Pseudocode of Greedy Feature Selection Wrapper with K2.**

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**Greedy feature selection wrapper with K2** (*originalTrain*, *maxFeatureSize*, *threshold*)

**INPUT**:

* *originalTrain* is the training dataset with the following order: *age group*, *diagnosis*, *finding* with the highest information gain score, …, *finding* with the lowest information gain score.
* *maxFeatureSize* is the number of features in the *originalTrain* file.
* *threshold* determines whether an increase of AUC is significant.

*(We used 0.0001 in our experiment.)*

**OUTPUT**:

* *BN-Greedy-K2* is the final Bayesian network

*temp\_train* = {*diagnosis*, *age group* of encounters in training dataset}

*best\_train* = *temp\_train*

*featureList* = {*age group*}

*currentAUC* = 0

*lastAUC* = 0

**FOR** k from 1 to 10 /\*10-fold cross validation\*/

{*temp\_train\_fold\_k*, *temp\_validation\_fold\_k*} = Sampling k th fold from *temp\_train*

*BN\_temp\_train\_fold\_k* is the Bayesian network learned from *temp\_train\_fold\_k* with K2

*tempAUC* = AUC of *BN\_temp\_train\_fold\_k* when testing with *temp\_validation\_fold\_k*

*currentAUC* = *currentAUC* + *tempAUC*

**END FOR**

*currentAUC* = *currentAUC* / 10

*lastAUC* = *currentAUC*

**FOR** n from 3 to *maxFeatureSize*

*temp\_train* = *best\_train* + nth featureof the *originalTrain* file

*increase* = false

*currentAUC* = 0

**FOR** k from 1 to 10 /\*10-fold cross validation\*/

{*temp\_train\_fold\_k*, *temp\_validation\_fold\_k*} = Sample k th fold from *temp\_train*

*BN\_temp\_train\_fold\_k* is the Bayesian network learned from *temp\_train\_fold\_k* with K2

/\* The configuration of K2 classifier is: maximum 2 parents, ordering: *age group*, *diagnosis*, finding with

highest information gain score, …, finding with lowest information gain score.\*/

*tempAUC* = AUC of *BN\_temp\_train\_fold\_k* when testing with *temp\_validation\_fold\_k*

*currentAUC* = *currentAUC* + *tempAUC*

**END FOR**

*currentAUC* = *currentAUC* / 10

**IF** *currentAUC* - *lastAUC* >= *threshold*

*increase*=true

*lastAUC* = *currentAUC*

*best\_train* = *temp\_train*

*featureList* = featureList + {nth feature}

**END IF**

**END FOR**

*BN-Greedy-K2* = the Bayesian network learned from *best\_train* with K2 algorithm

**RETURN** *BN-Greedy-K2*

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