

1 Experiment description

We trained the model choosing the training set in different ways, namely filtering the data with different criteria. The goal is to predict whether a patient will result positive or not in the near (to be defined later) future, given a number of visits in which the patient results unaffected by the disease (more precisely has zero SDI).

Positives. We used as positive examples all the patients which are negative at the first visit but results positive in later visits (i.e. we exclude completely all the patients which are positive from the first visit). We use as training sequences only the visits in which the patients has zero SDI .

Negatives. For the negative examples we choose only the patients which satisfy some temporal constraints. The first requirement is for the recorded history of a patient to be long enough to be able to leave out the last part of it from the training sequence. This ensures that we train the model to give a prediction valid, at least, for such given span of years. We measure this time (in years) with the parameter **upper span age**. We then require the remaining part of the visits (which are the only ones used in the training sequence) to cover a sufficiently long period of time with the parameter (in years) **lower span age** and to be composed by at least **min visits** number of visits.

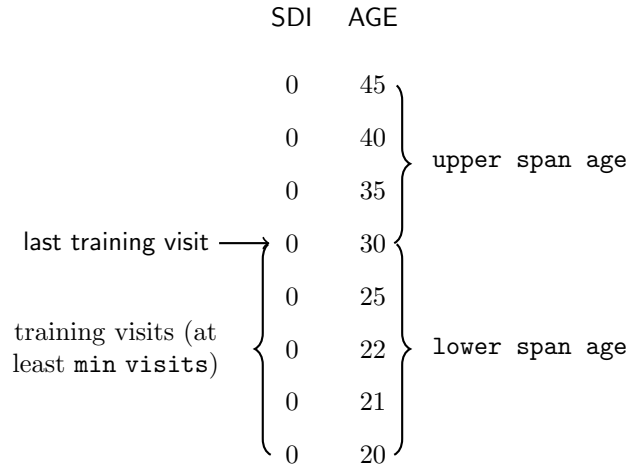


Figura 1: Example of a negative training sequence.

Experiment setup We explored all the combination for **upper span age** in [1, 2], **lower span age** in [1, 2], **min visits** in [2, 3, 4, 5]. The results are shown in Table (1).

upper span age	lower span age	min visits	auc roc score	pos	neg
1	1	2	0.62	43	127
1	1	3	0.71	43	118
1	1	4	0.74	43	107
1	1	5	0.77	43	87
2	1	2	0.65	43	87
2	1	3	0.70	43	83
2	1	4	0.75	43	67
2	1	5	0.75	43	48
1	2	2	0.71	43	86
1	2	3	0.69	43	85
1	2	4	0.73	43	84
1	2	5	0.76	43	74
2	2	2	0.67	43	44
2	2	3	0.71	43	43
2	2	4	0.74	43	41
2	2	5	0.75	43	35

Tabella 1: AUC ROC score for different training sets. Best score in bold.

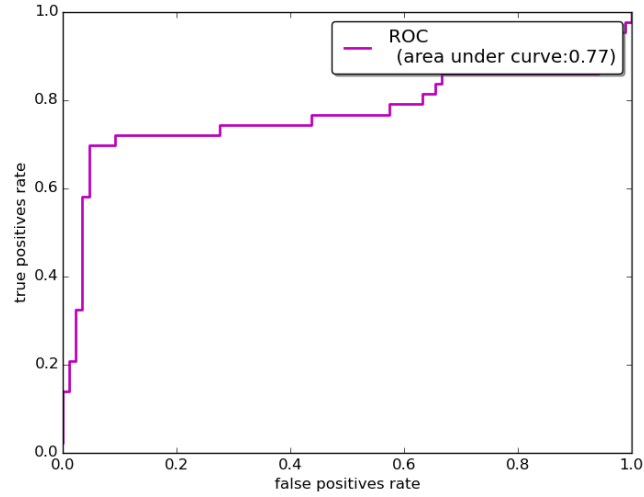


Figura 2: roc curve for the best model

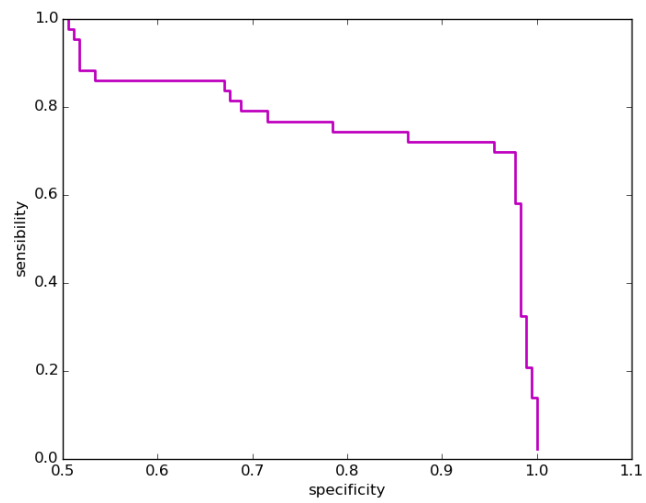


Figure 3: sensibility-specificity curve for the best model

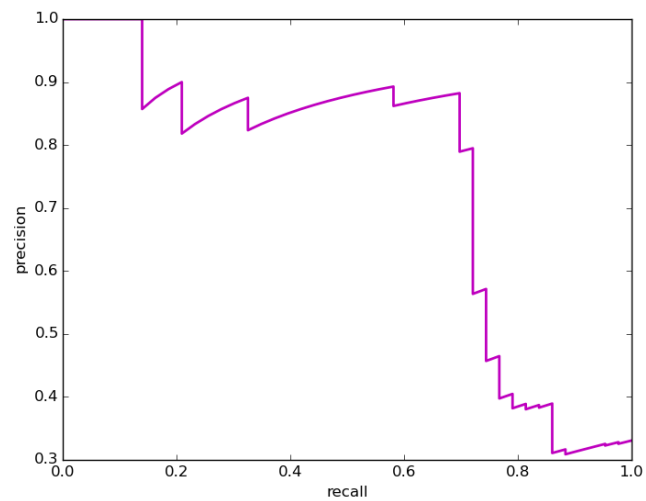


Figure 4: precision-recall curve for the best model