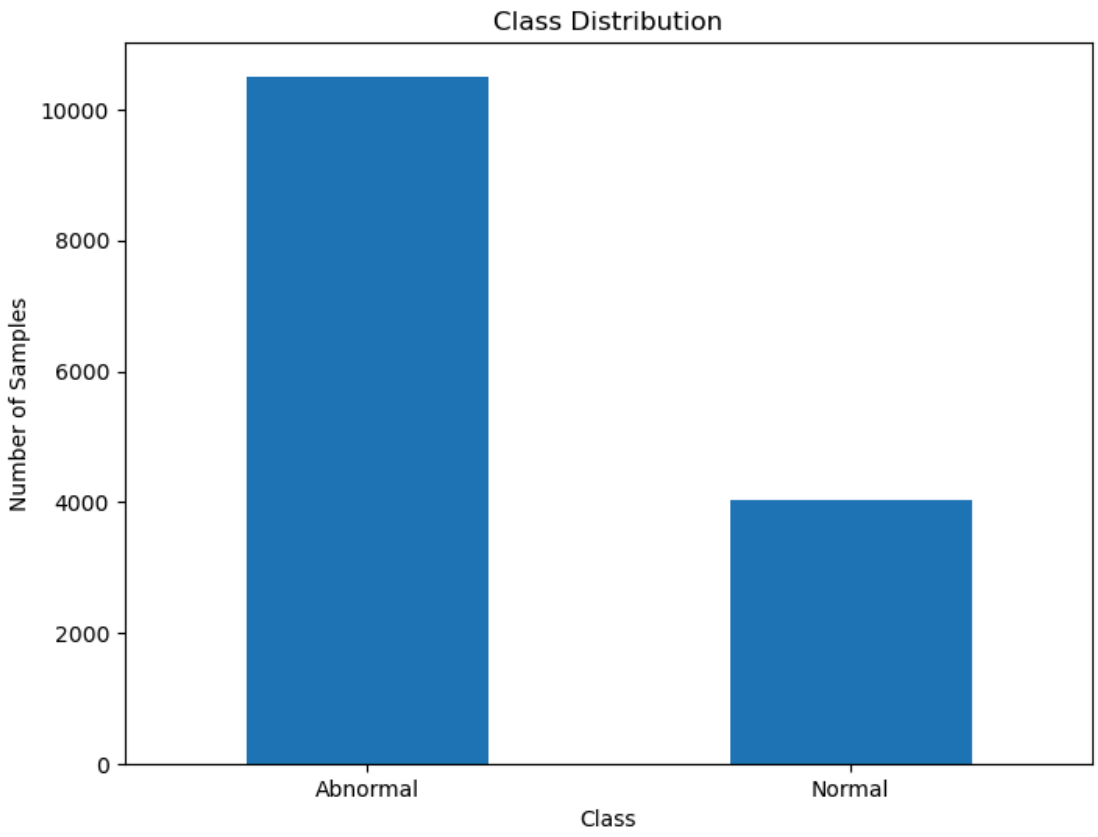
Tema 2 ML

Cerinta 3.1

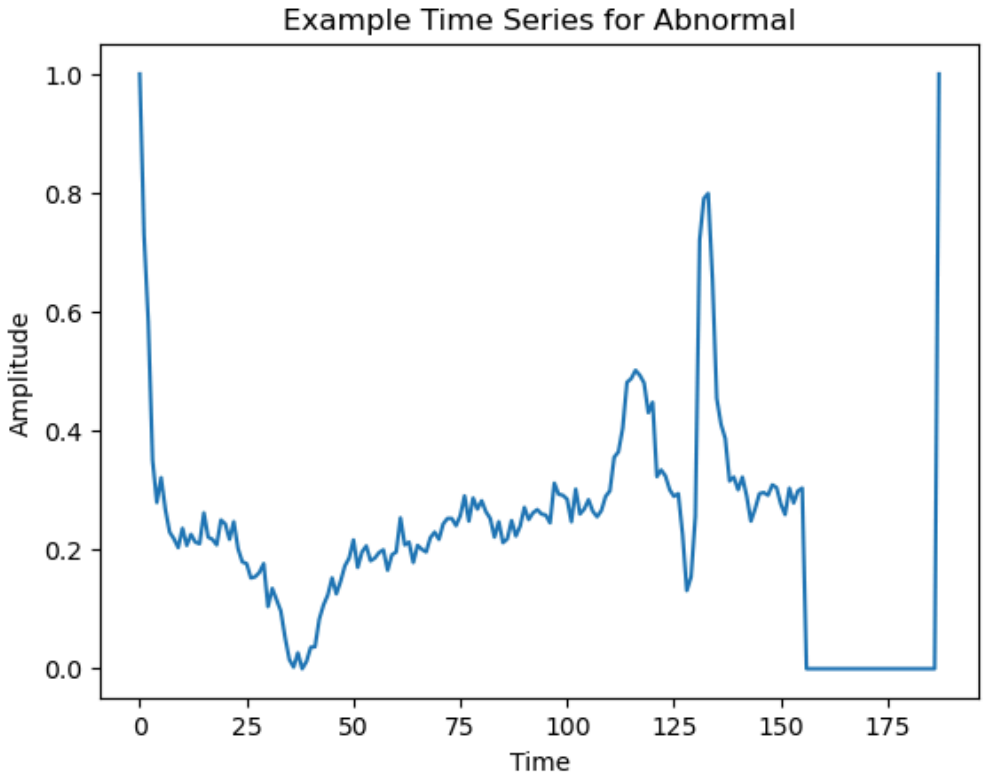
A. Analiza echilibrului de clase

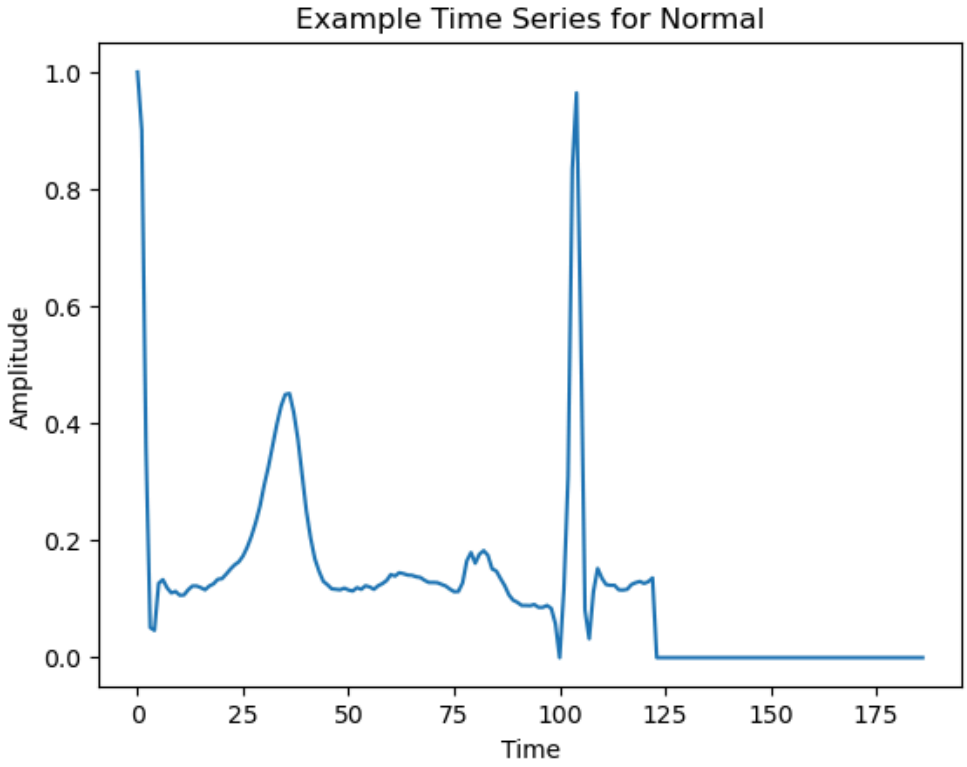


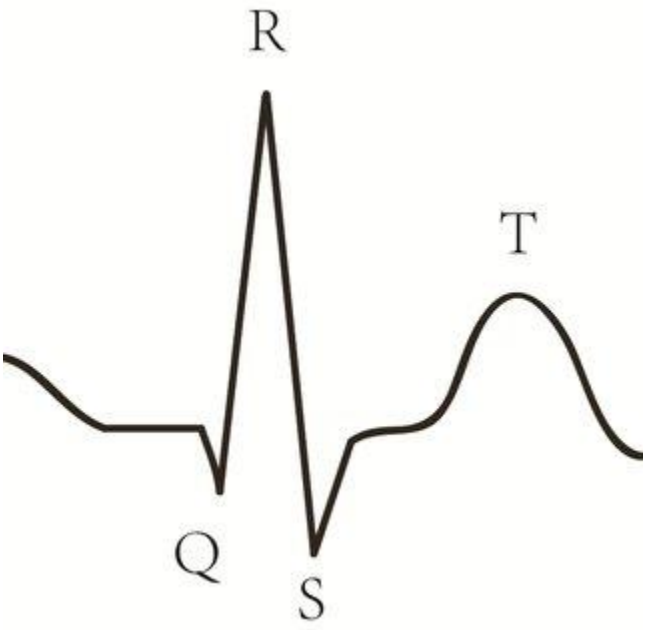
Clasele sunt destul de dezechilibrate, ceea ce va deveni o problema. Am adresat aceasta problema cand fit uiam modelul prin parametrul de class_weights.

B. Vizualizarea seriilor de timp

1. Exemplu serie de timp

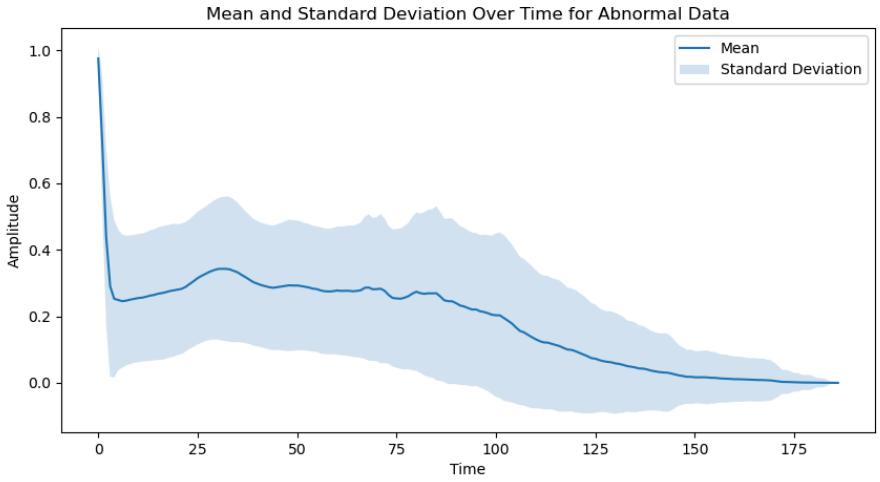




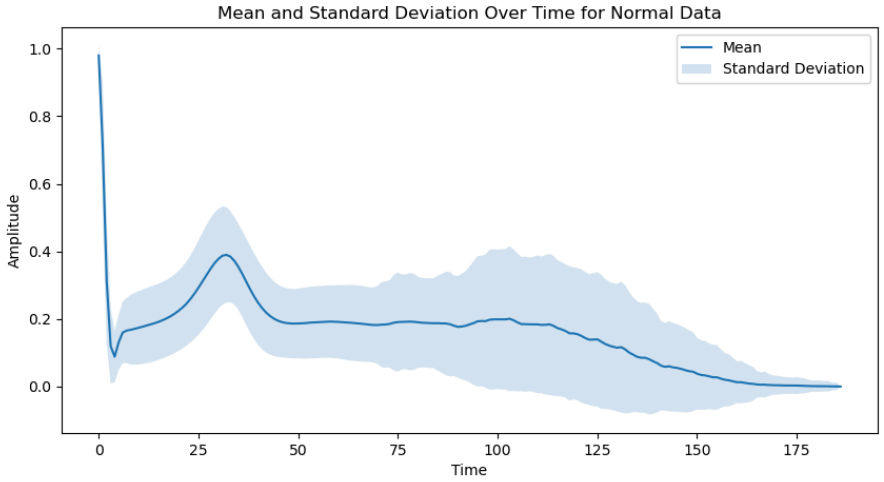


Am cautat cum arata o bataie normala ca sa inteleg ce face graficul normal sa fie normal si ce e diferit la cel anormal.

2. Media si deviatia standard



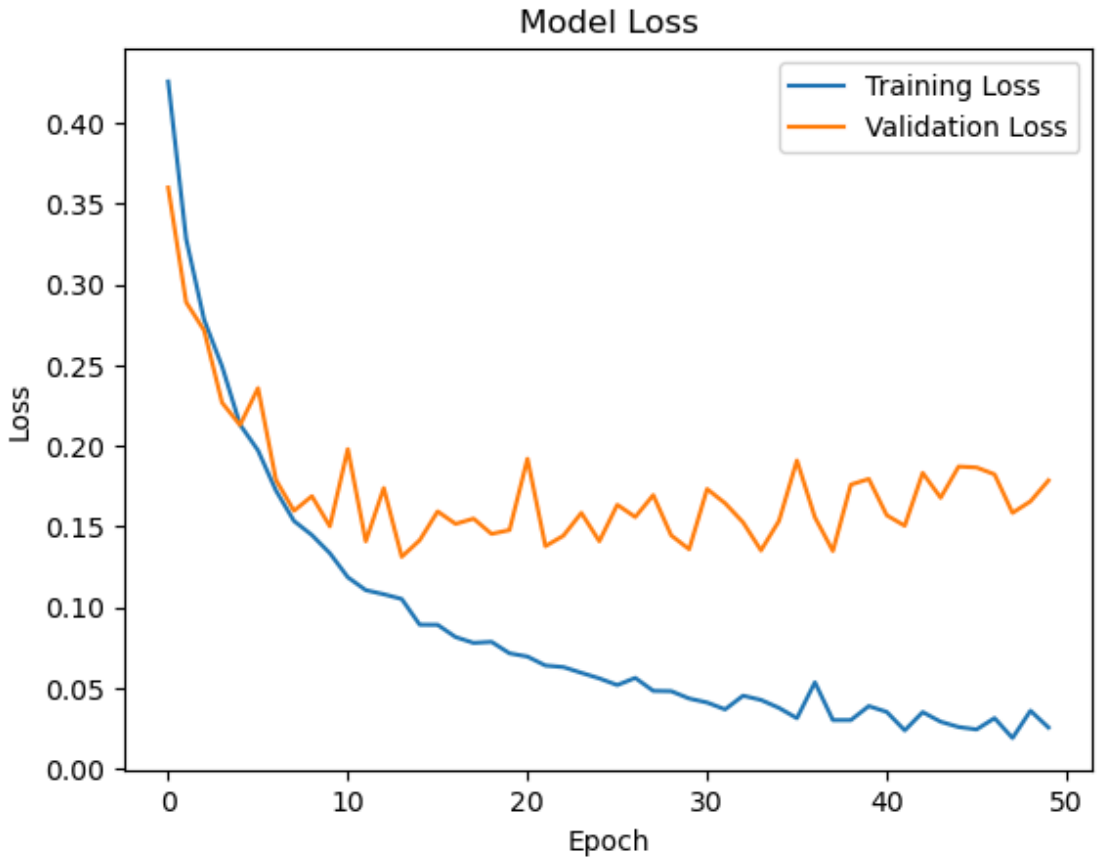
La varianta cu aritmii se vede cum la medie nu se mai vede niciun pattern.



La varianta normala se vede clar un varf, probabil al doilea varia mai mult (se vede ca in zona aia e deviatia standard mai mare, in rest e mai mica).

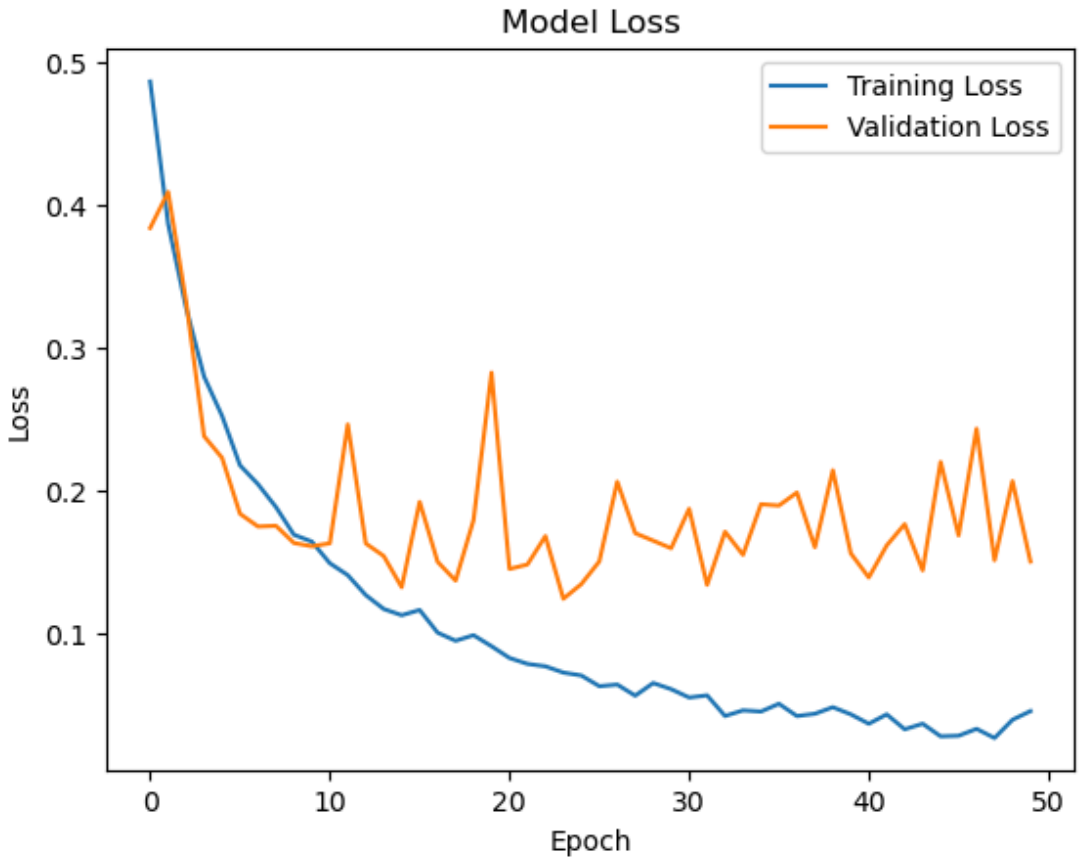
Cerinta 3.2 -> Arhitecturi MLP

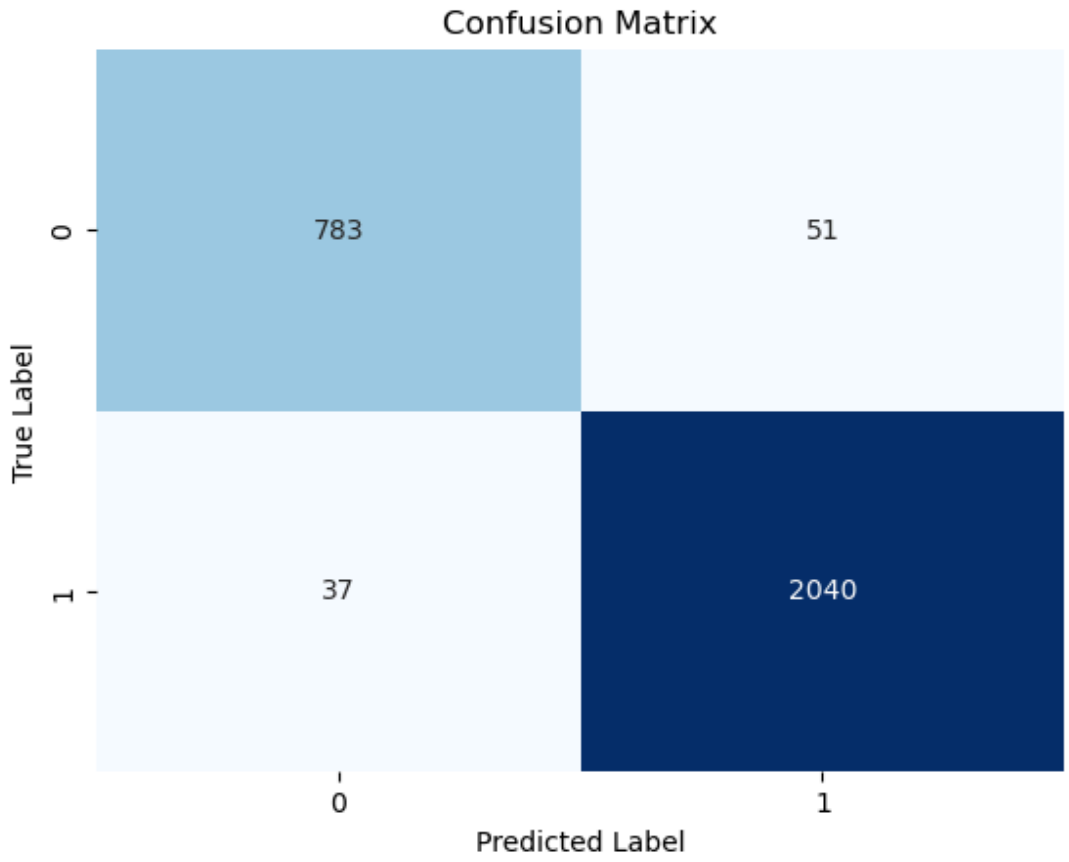
Pentru Patients



Pentru diagnostic am folosit un MLP cu multiple straturi pentur a prezice diagnosticele (D0 - D6).

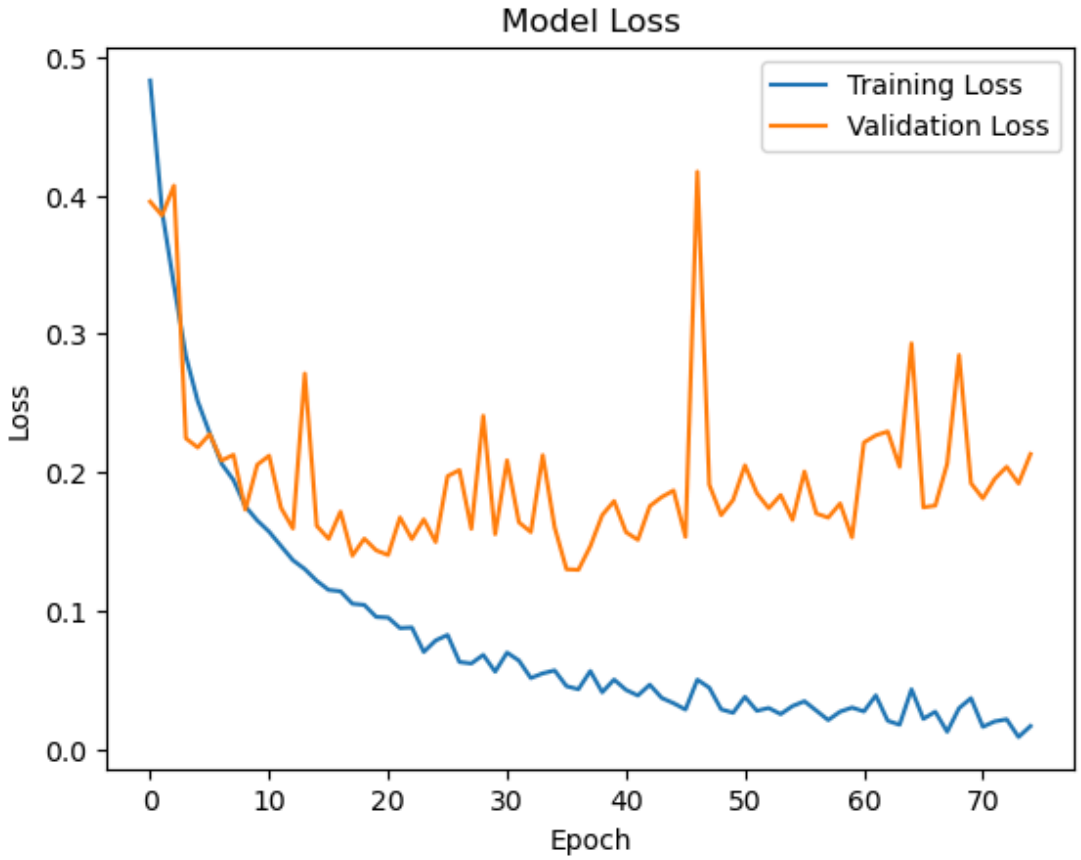
Pentru Diagnostic ECG





Conf	Accuracy	Precision	Recall	F1 (normal)	F1 (abnormal)
Conf1	0.958	0.959	0.958	0.929	0.97
Conf2	0.969	0.969	0.969	0.947	0.979
Conf3	0.964	0.964	0.964	0.933	0.977
Conf4	0.954	0.956	0.954	0.923	0.968

Configuratiile 1 si 2 sunt identice (4 straturi dense, de dimensiunile 64, 32, 16, 1, primele 3 sunt de tip relu, ultimul sigmoid), doar ca configuratia 2 tine cont de dezechilibrul de clase (fit function ul are pusa optiunea de weights) si 50 de epochs.
Configuratia 3 e la fel ca 2, dar are 75 de epochs. Se vede ca nu e bine pentru ca ajunge sa fie un pic overfit:



Pentru Conf4 am experimentat cu mai multe straturi in plus, dar nu am obtinut rezultate mai bune.