

SEPARATION PROCESS CONTROL SYSTEM IN THE CEMENT PRODUCTION FACILITY

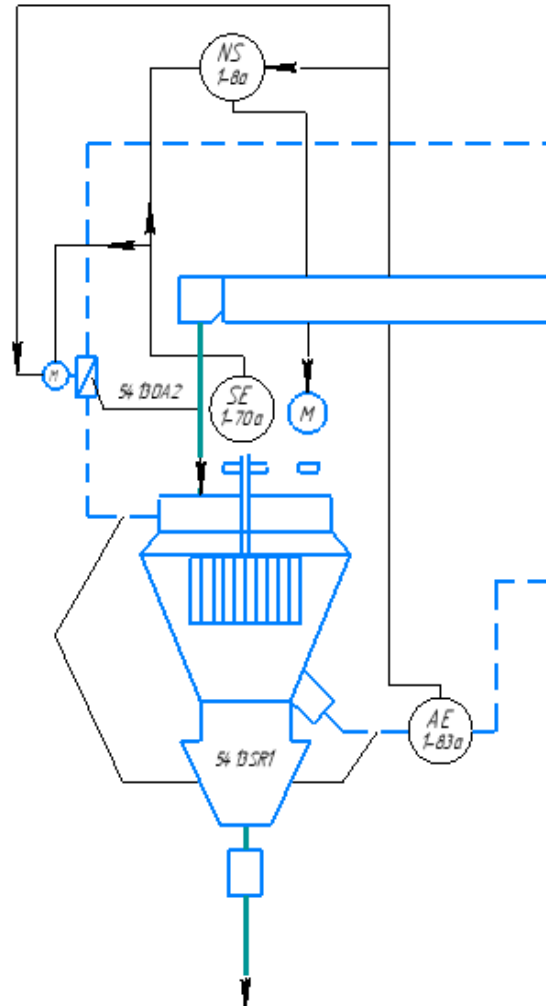
Ufa State Petroleum Technological University, Branch in Sterlitamak,
Sterlitamak, Russian Federation

E.A. Muravyova

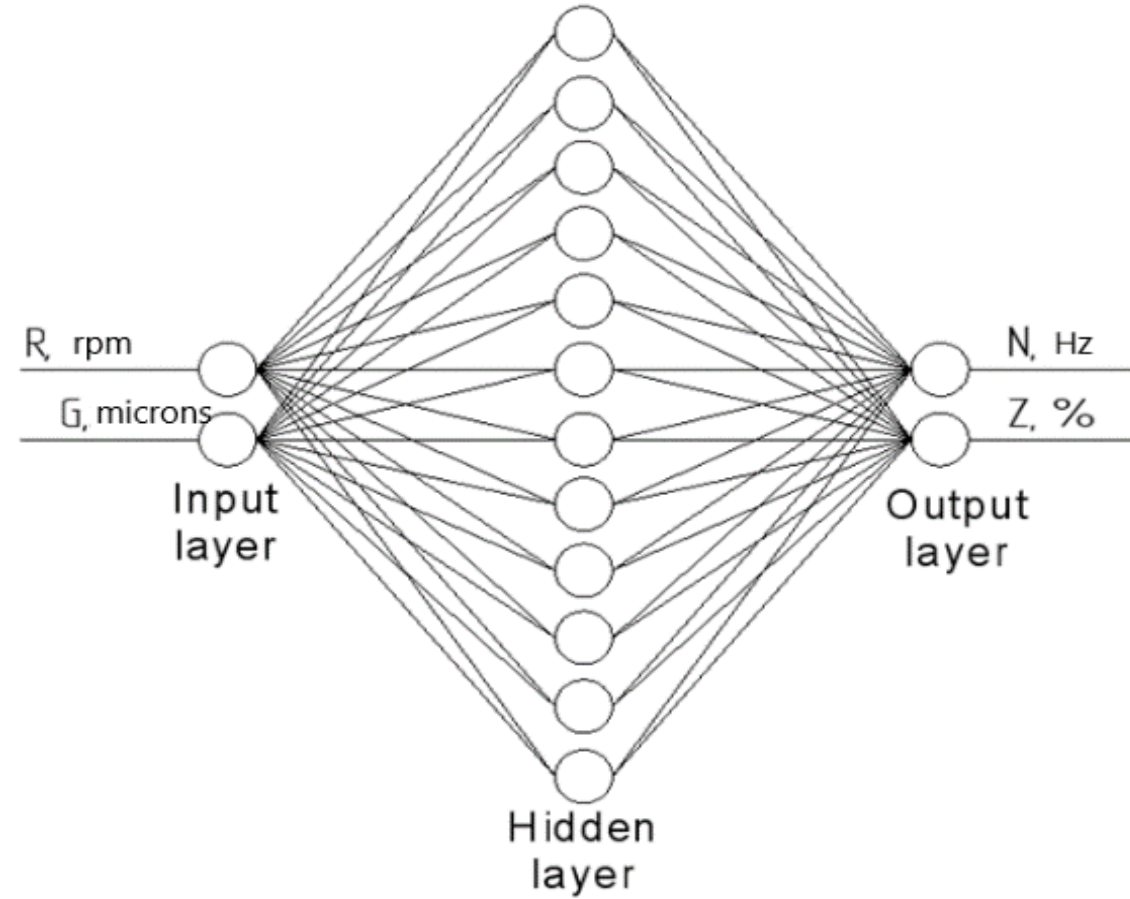
R.F. Gabitov

P.A. Sabanov

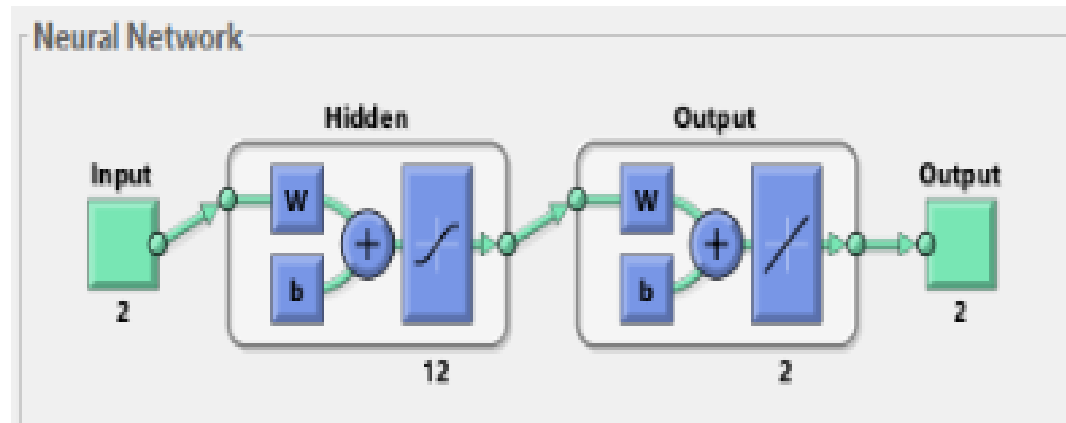
Diagram of the separation unit

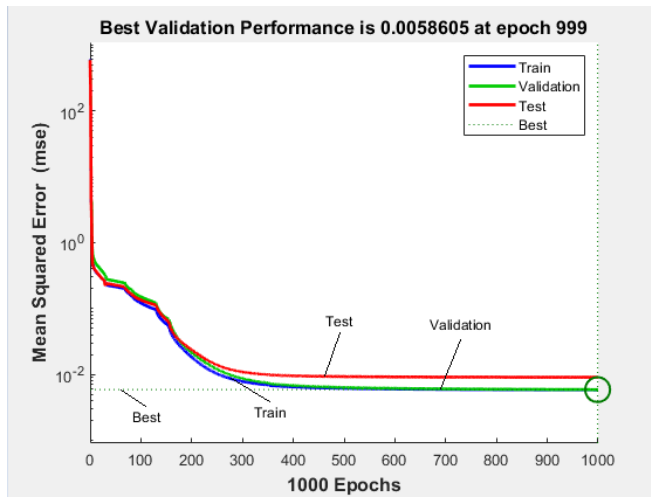


Block diagram of neural network

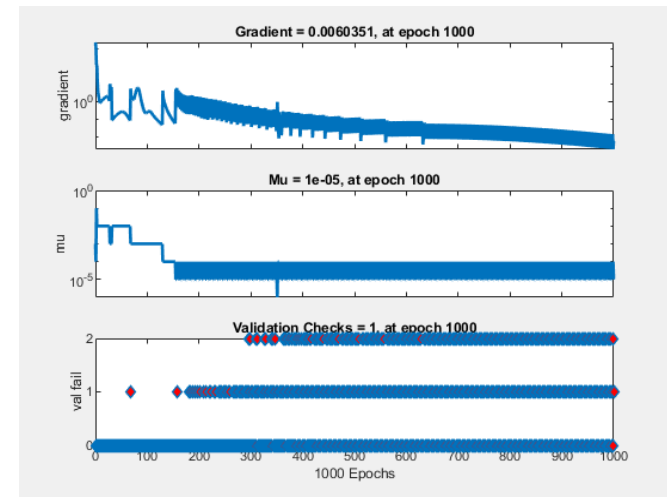


Structure of neural network

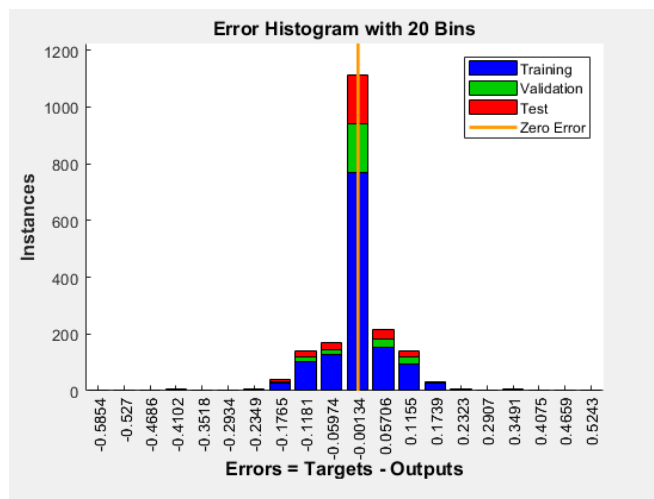




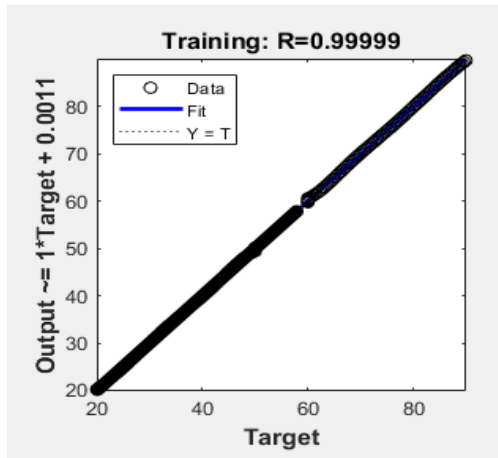
The root-mean-square error



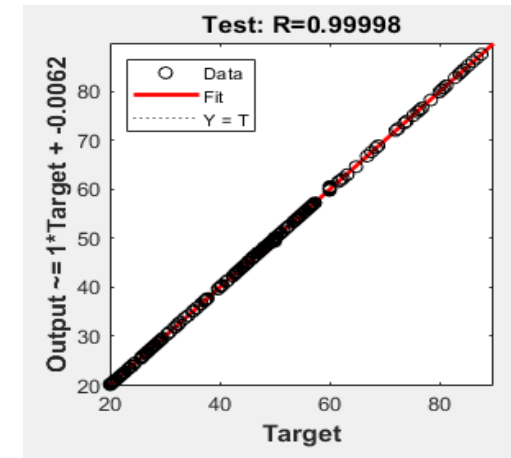
Neural network training graphs



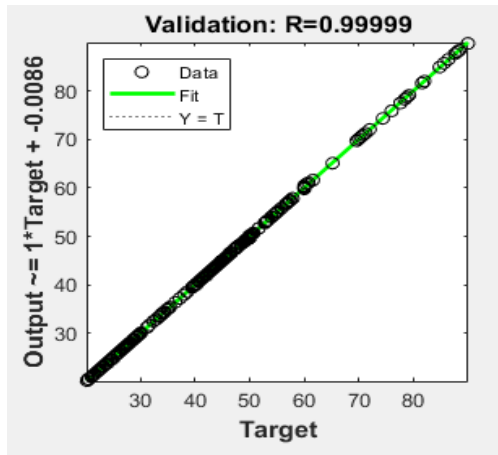
Histogram of errors



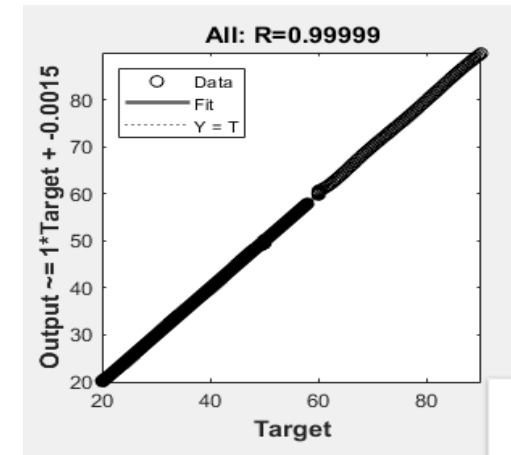
Schedule regression mode “training”



Regression graph of the test mode



Regression graph of the “check” mode



Schedule of regression of all modes

Neural network program code

```
NS.m x +
% Solve an Input-Output Fitting problem with a Neural Network
% Script generated by Neural Fitting app
% Created 17-Jun-2019 17:25:37
%
% This script assumes these variables are defined:
%
%   InputVariable - input data.
%   Outputvariable - target data.

- x = InputVariable';
- t = Outputvariable';

% Choose a Training Function
% For a list of all training functions type: help ntrain
% 'trainlm' is usually fastest.
% 'trainbr' takes longer but may be better for challenging problems.
% 'trainscg' uses less memory. Suitable in low memory situations.
- trainFcn = 'trainlm'; % Levenberg-Marquardt backpropagation.

% Create a Fitting Network
- hiddenLayerSize = 12;
- net = fitnet(hiddenLayerSize,trainFcn);

% Setup Division of Data for Training, Validation, Testing
- net.divideParam.trainRatio = 70/100;
- net.divideParam.valRatio = 15/100;
- net.divideParam.testRatio = 15/100;
```