

Development and Implementation of Regulators Based on Artificial Neural Networks in the Process of Training Specialists in Automated Control Systems



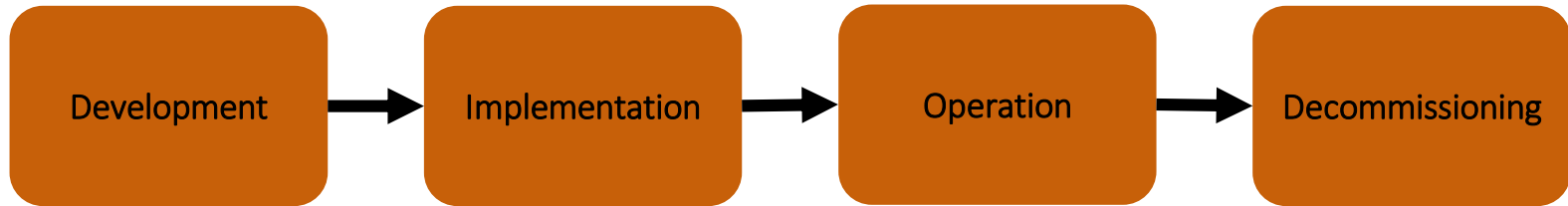
**Danila
Dementev
NRU "MPEI"**

Authors:

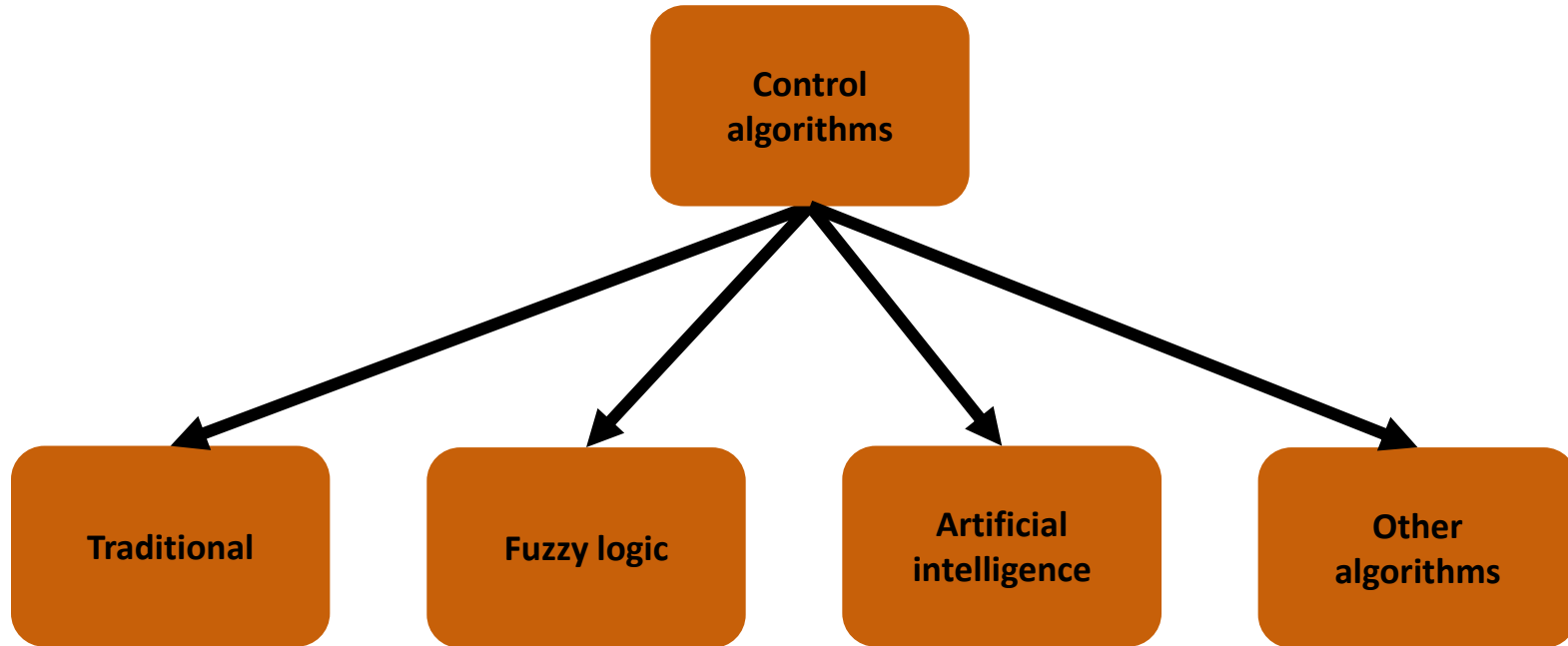
Sergey Mezin, NRU "MPEI"

Ekaterina Maximova, NRU "MPEI"

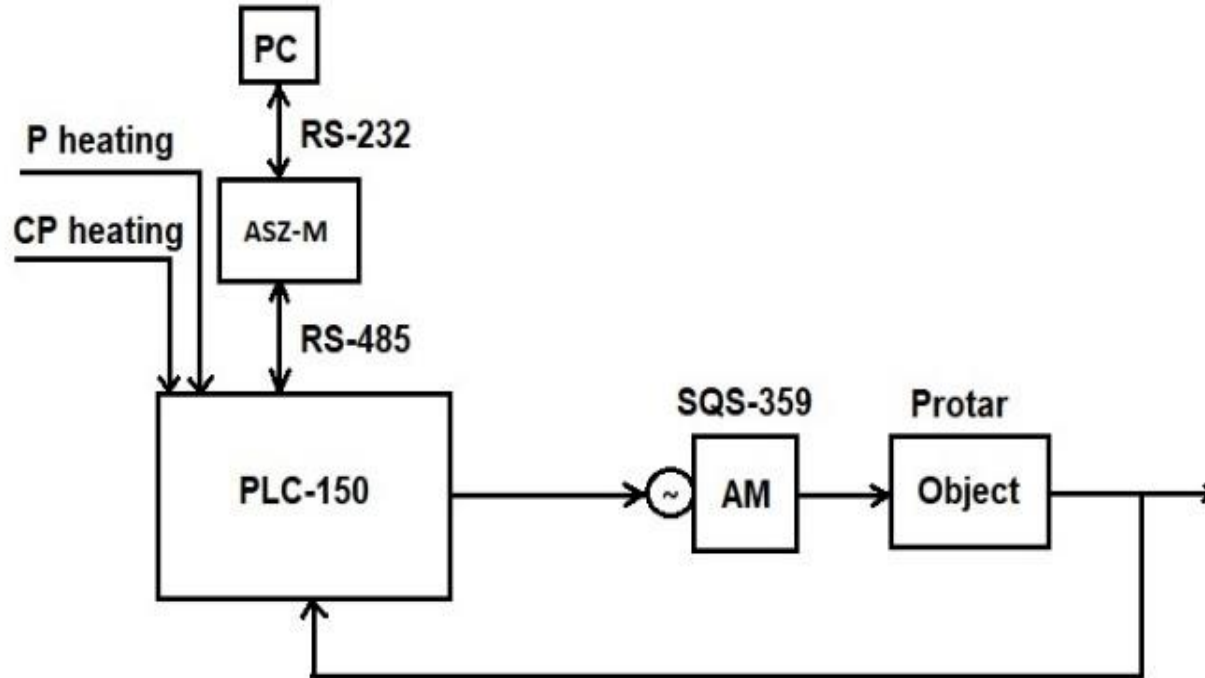
Danila Dementev, NRU "MPEI"



ACS life cycle



Main groups of control algorithms

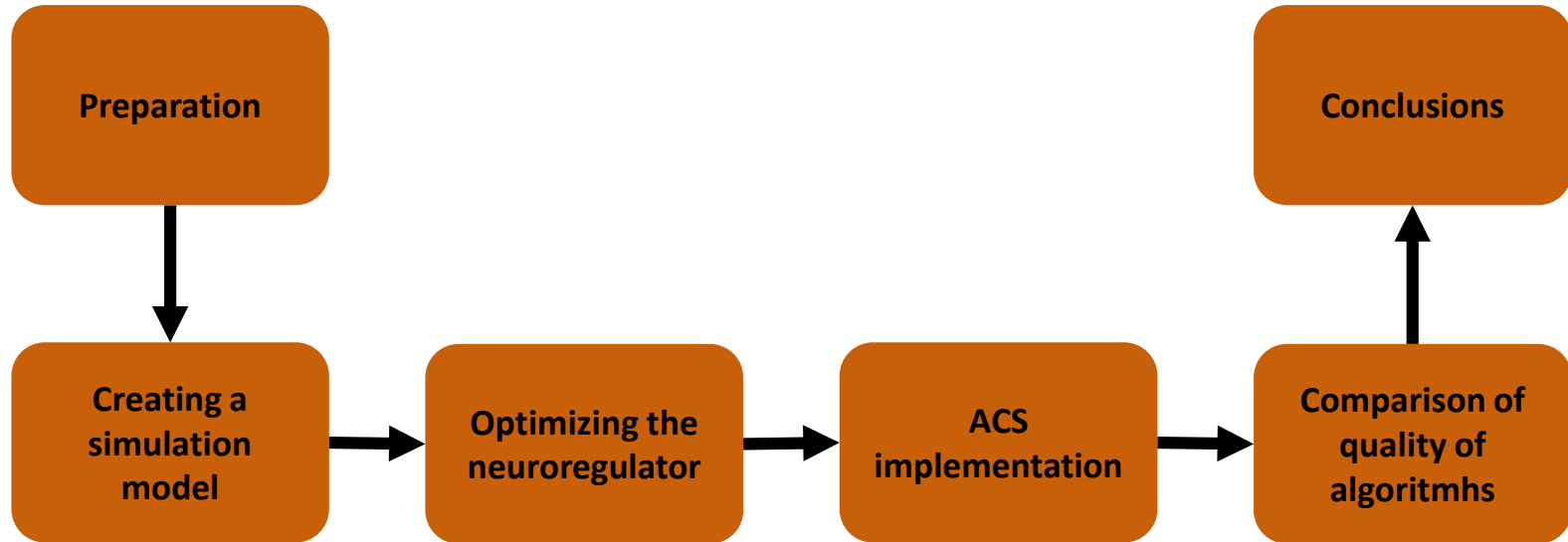


Structural scheme of laboratory stand ACS

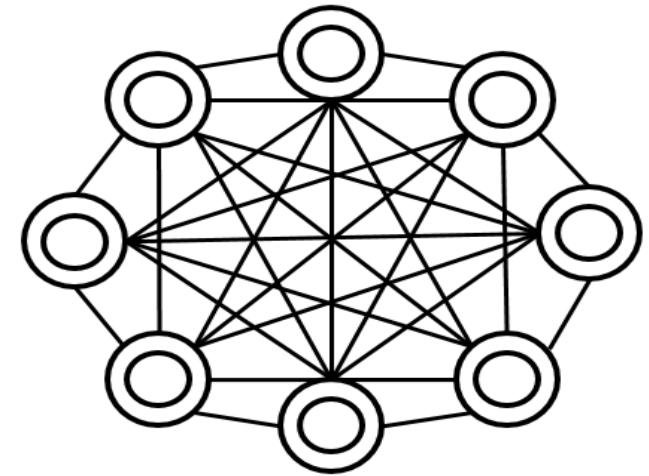
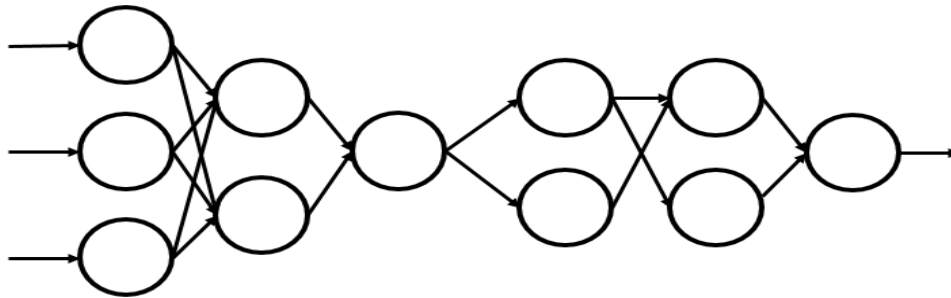
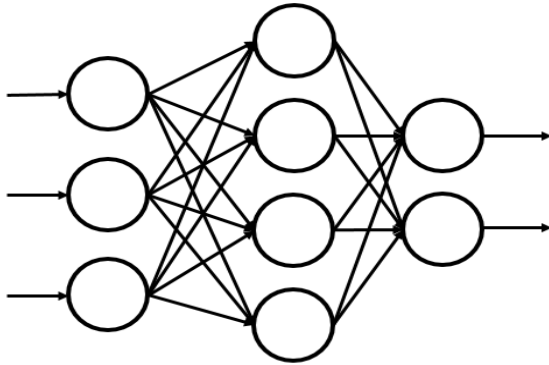
Development and Implementation of Regulators Based on Artificial Neural Networks in the Process of Training Specialists in Automated Control Systems



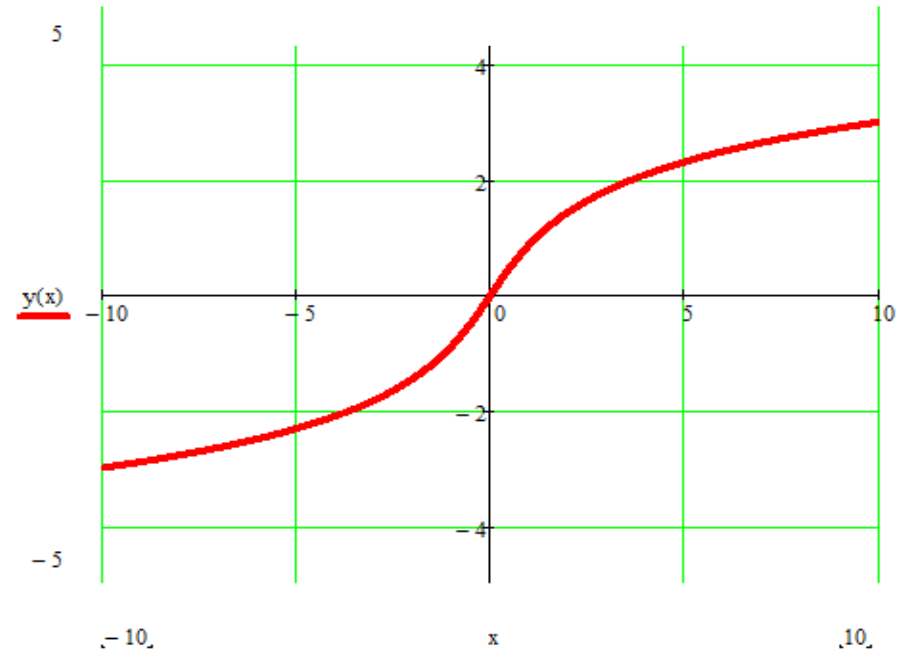
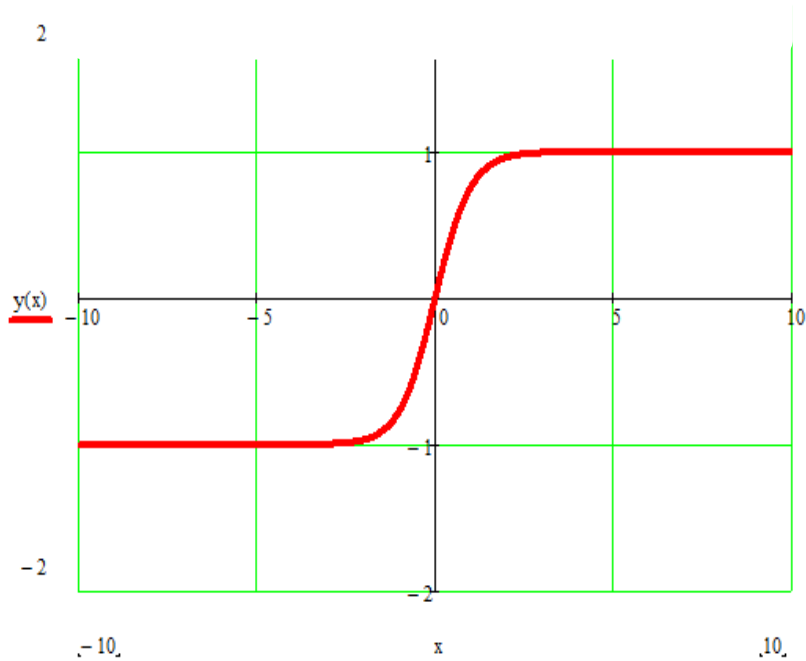
Laboratory stand



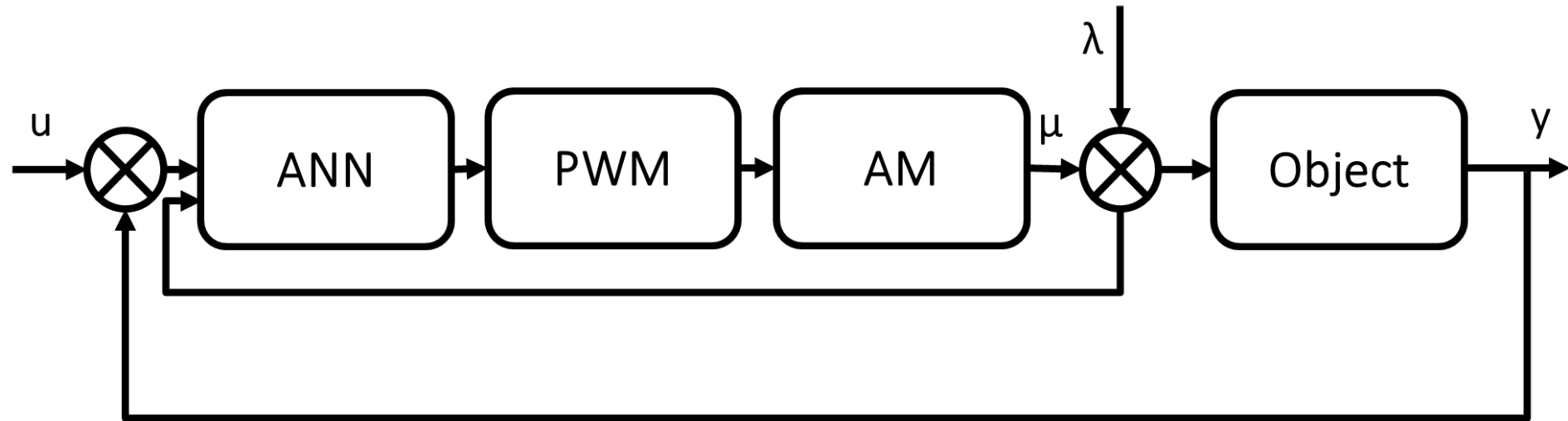
Stages of laboratory work



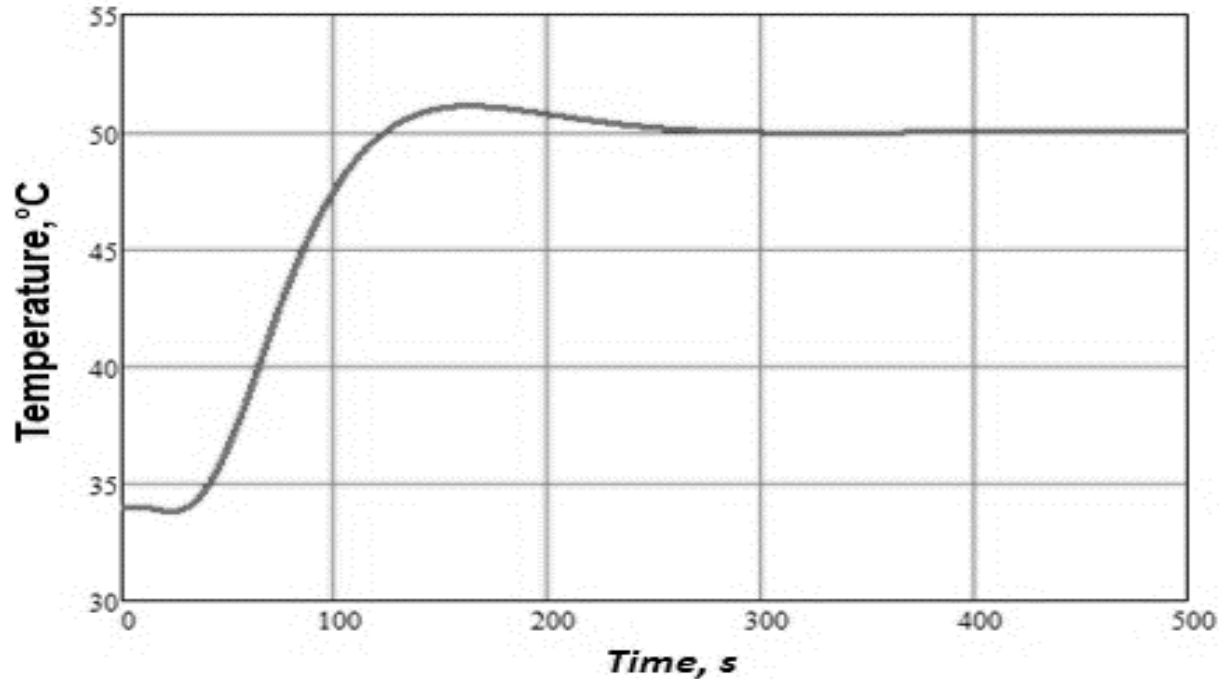
ANN structures



Neuron activation functions



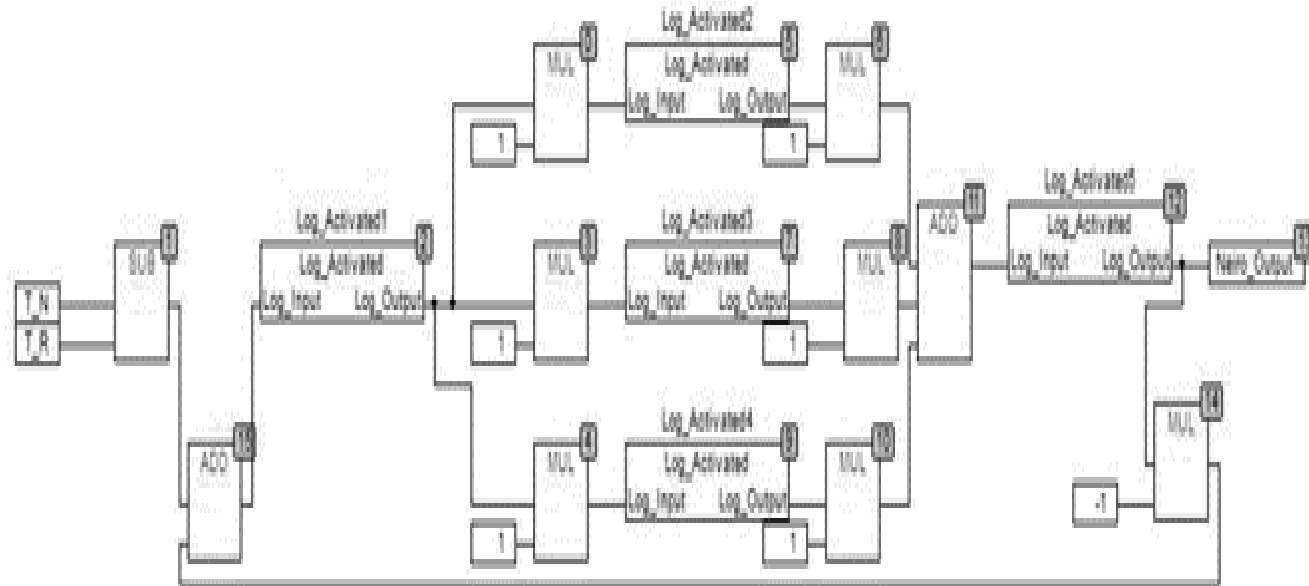
Structural scheme of ACS with a neuroregulator



Acceleration curve of the technological object

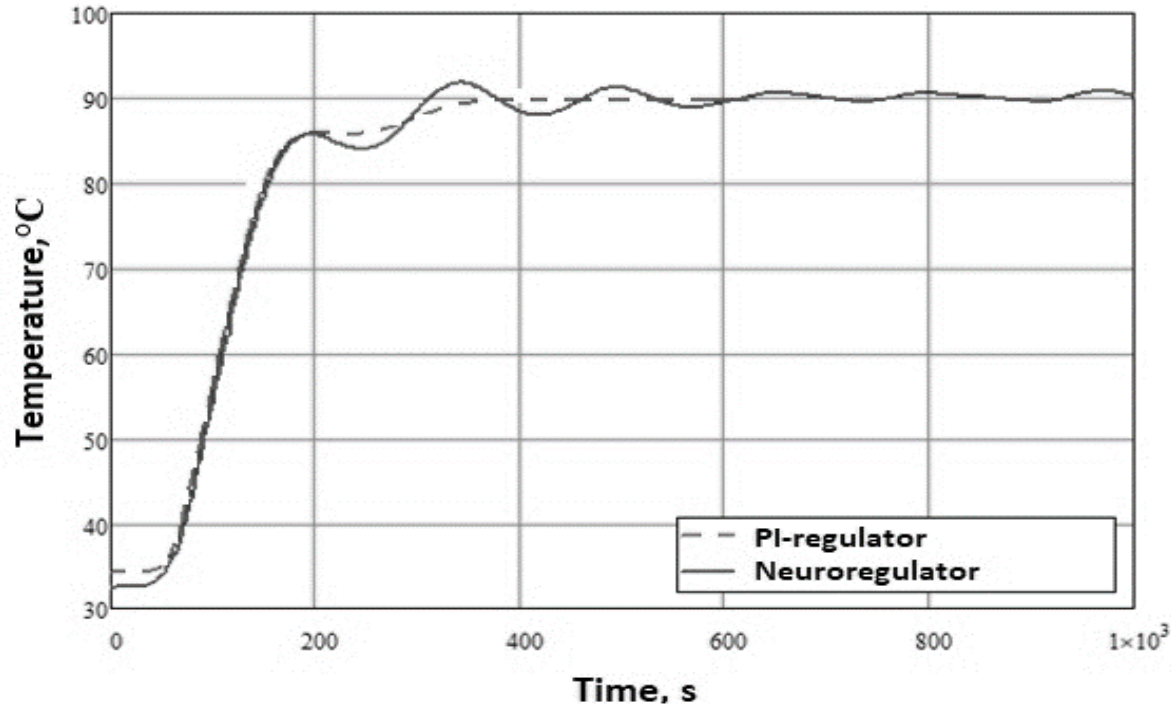
System components affecting optimization:

- a pulse width modulator
- structures of the ANN
- number of information inputs
- target function
- optimization algorithm



Neuroregulator structural scheme in Codesys

Development and Implementation of Regulators Based on Artificial Neural Networks in the Process of Training Specialists in Automated Control Systems



Results of the algorithm comparison

Quality indicators :

- Absolute quality indicator
- attenuation degree
- maximum allowable deviation
- process control time

Thank you for attention!

Speaker's contacts:



Danila Dementev

NRU "MPEI"

e-mail: daniladementev202@gmail.com

