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Computer Neural Network for Diagnostics of Eye Diseases

Dubich, V.

Presented at Med-e-tel 2005 Conference in Luxembourg.

<http://hdl.handle.net/123456789/3543>

Presentation

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IST based health systems

**COMPUTER NEURAL NETWORK
FOR DIAGNOSTICS
OF EYE DISEASES**

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Technological expertise

- **objective**

A computer system for diagnostics of eye diseases:

- *glaucoma,*
- *diabetic retinopathy,*
- *and others,*

using computer neural network software.



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Technological expertise

- **stages of diagnostic system development**
 1. *Collecting rheograms at the ophthalmology hospital*
 2. *Preparing input data*
 3. *Choosing software and creating the neural network*
 4. *Training the neural network*
 5. *Testing the neural network*
 6. *Piloting the diagnostic system at the ophthalmology hospital*
 7. *Applying the diagnostic system at ophthalmology hospitals*

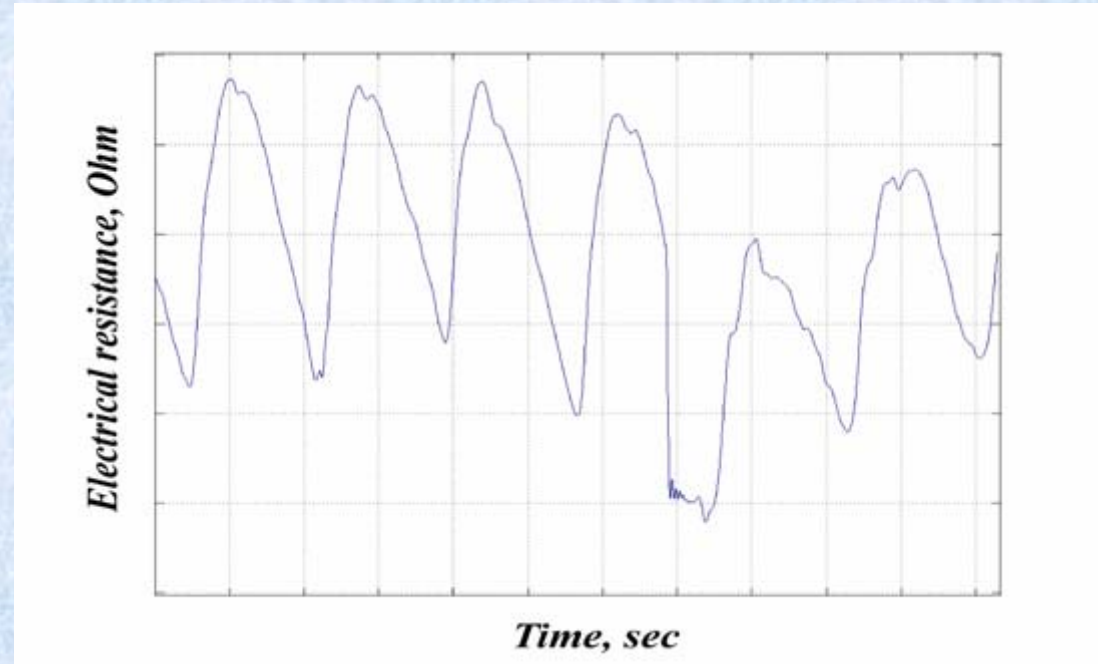


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Technological expertise

- **approach**

A special curve called rheogram is used.



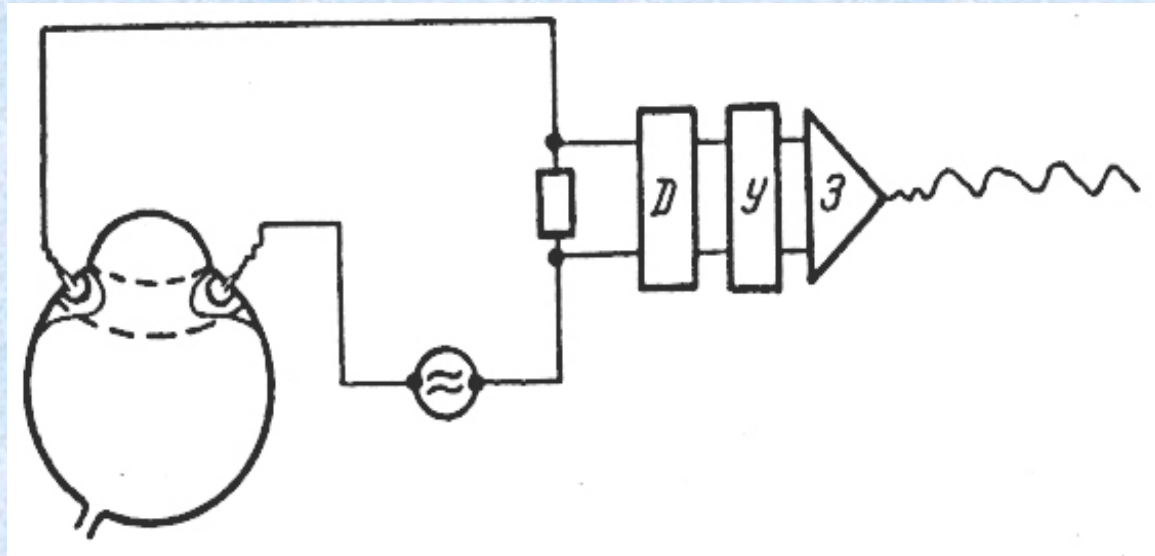
It is obtained from registration of eye tissue resistance to electric current.



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Technological expertise

- stage 1: collecting rheograms at the ophthalmology hospital



The circuit of the device for eye tissue electrical resistance registration - rheograph



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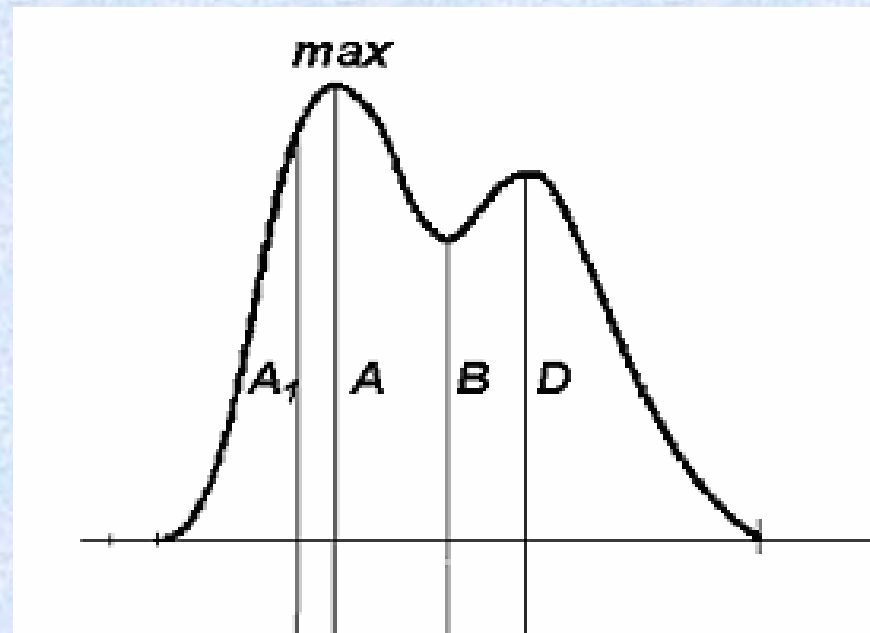
Technological expertise

- stage 2: preparing input data

- *physiological parameters*

- *Fourier series*

- *wavelet series*





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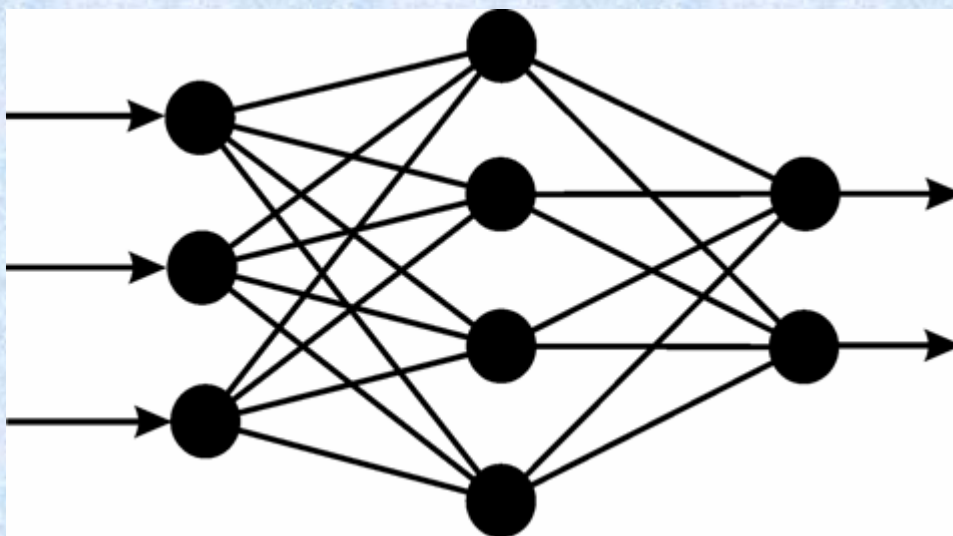
Technological expertise

- **stage 3: choosing software and creating the neural network**

*Input data:
rheograms*

The neural network

*Output data:
diagnosis*





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Innovative aspects

- stages 4-5: training and testing the neural network

	<i>Accuracy of diagnoses</i>		
	<i>MAT LAB</i>	<i>Deductor</i>	<i>Neuro PRO</i>
<i>Physiological parameters</i>	<i>60%</i>	<i>–</i>	<i>60%</i>
<i>Fourier series</i>	<i>75.5%</i>	<i>67%</i>	<i>–</i>



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Technology application

- stages 6 - 7: piloting and applying the diagnostic system at ophthalmology hospitals



*Obtaining a patient's
rheogram – rheograph*

*Preliminary diagnosis –
computer system*

*Final diagnosis –
ophthalmologist*



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Project idea

E-DIAGNOST

*Integration of computer technologies
for diseases diagnostics.*

Partner expertise required

- *Research groups with expertise in computer diagnostics of diseases.*



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