Intellectual Processors Ltd

was created in 2005 by scientists and researchers from Byelorussian State University of Informatics and Radioelectronics

<u>R&D activity focuses on</u>
• fundamental and applied aspects in areas of image processing, pattern recognition and fuzzy control;
• software development with hardware support for real time processing.
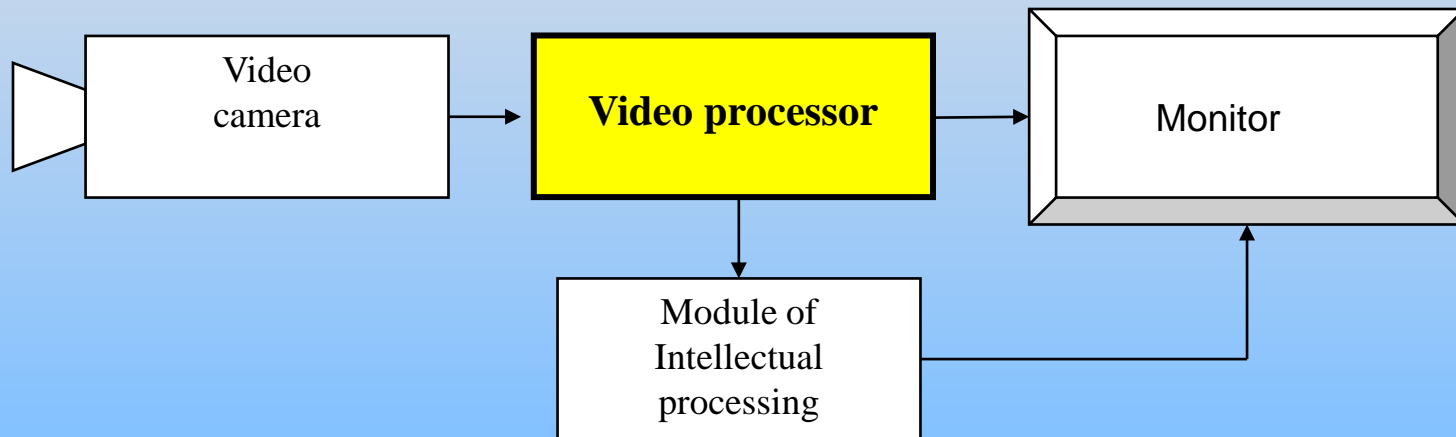
<u>Our contract experience</u>

1. Fraunhofer Institute for Nondestructive Testing, Branch Dresden (Germany) – "Software for visual control of wafer product technology"

2. Procon Systems GmbH (Germany) – "Smart House System"

3. Number companies from Russia and Belarus – "Video processors" and "Neuron Processors" for any applications

We looking for partners, customers, promoters for our scientific products as "Video processor" and "Neuron processor"

"Video processor"

is complex of algorithms, software and hardware for
solve of concrete applied task

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  ┌──────────┐        ┌──────────────┐        ┌──────────┐
  │  Video   │  ───►  │Video processor│  ───► │ Monitor  │
  │  camera  │        └──────┬────────┘        └────▲─────┘
  └──────────┘               │                      │
                             ▼                      │
                      ┌──────────────┐              │
                      │  Module of   │              │
                      │ Intellectual │──────────────┘
                      │  processing  │
                      └──────────────┘
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Application:
- imaging quality increasing in noise conditions;
- image reconstruction with resolution increasing (Zooming) by
means of set images processing;
- static image reconstruction by means of video set (dynamic)
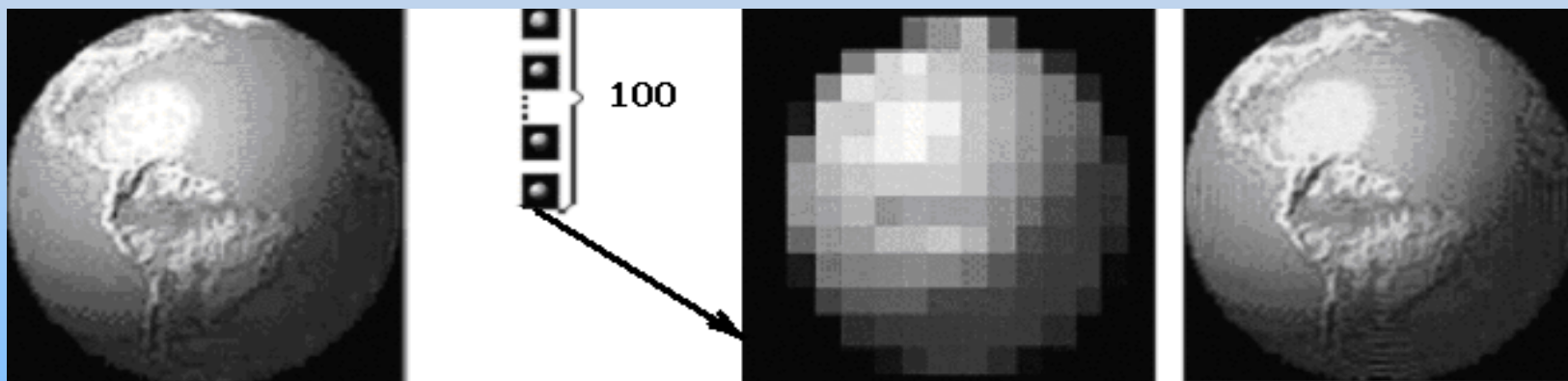images processing.

Example of imaging quality increasing in noise conditions
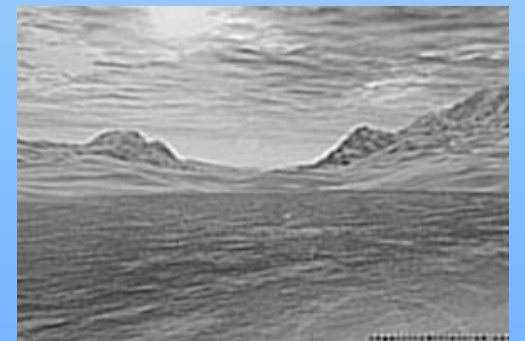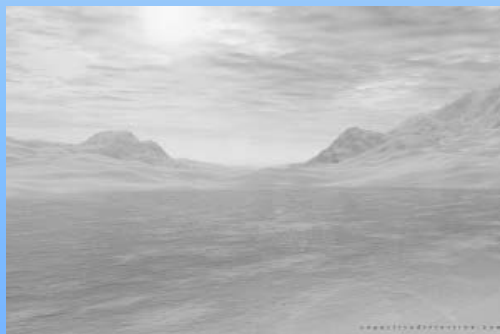
Initial images

Variants of imaging quality increasing

Example of resolution increasing

Etalon image

Set of initial images

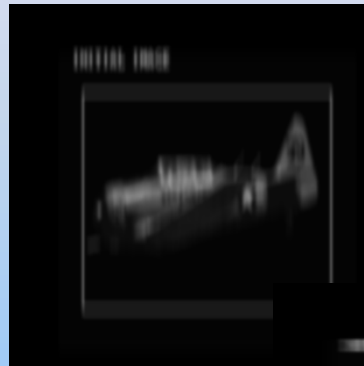Zooming by means of "usual" algorithms

Produced image by means of original algorithms

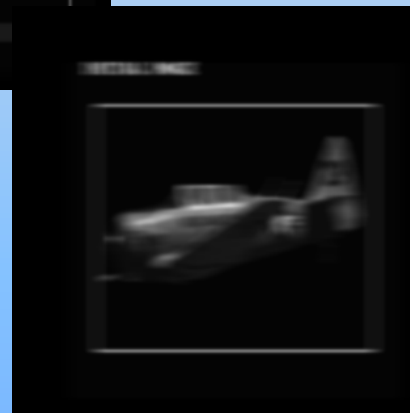# Example of static image reconstruction by means of video set (dynamic) images processing
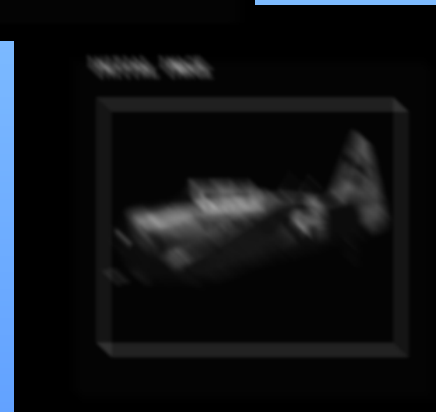

ZP1

Etalon image

$SMAZ_0$

$SMAZ_2$

Produced image

Dynamic sequence of initial images

$SMAZ_1$

"Neuron processor"

is complex of algorithms, software and hardware for
solve of concrete applied task

Learn 2

Learn1

| Deciding Making Criteria | Standards |

Set of learn vectors 2

Set of learn vectors 1

Input images

Input images

Preprocessing 2

Preprocessing 1

Informative features extracting

"Neural processor"

Recognition

Used as intellectual core in the recognition systems:

for image types, photoportraits, fingerprints, objects in the
photographs of remote sensing and the like;
for sounds and speech;
for the sources of radar signals;
for guidance and navigation systems.
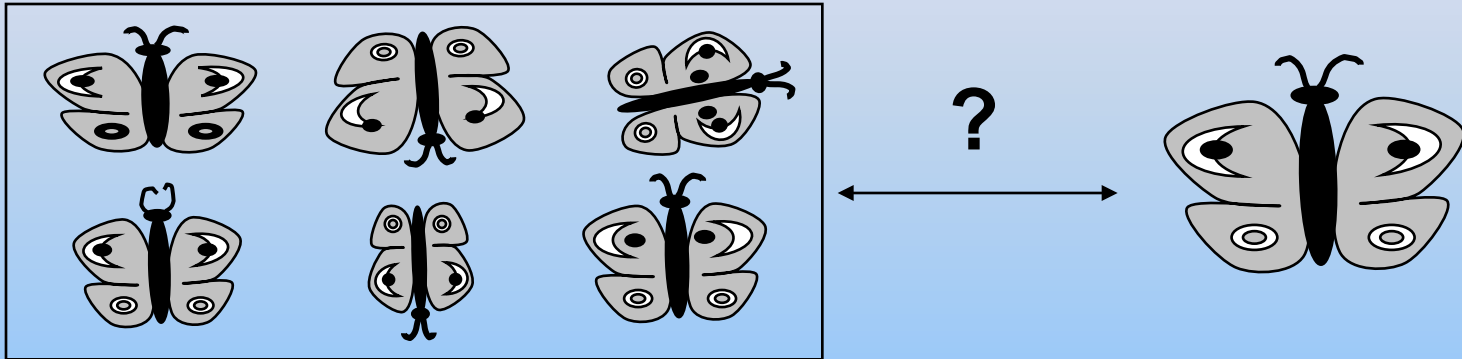
Example of neural processor application in recognition problem

Initial data for the development are:
• the number of informative features;
• the number of identified classes;
• the authenticity of recognition;
• productivity (number of identified vectors per unit time);
• the number of data digit, the method of data presentation (fixed/floating point);
• the interfaces of interaction with the external subsystems.

Development stages

- Development of the mathematical models
- Development of the algorithmic models
- Development of program model
- Development of physical models (prototypes) on the model FPGA or DSP boards

Our proposals

Our company will develop the prototypes "of the video processor" and "neuron processor" for the concrete technical demands of customer.

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