



University of Calgary

PRISM: University of Calgary's Digital Repository

Research Centres, Institutes, Projects and Units

E-Health Resource Repository

2005-04-08

Application of Video Technologies and Patterns Recognition in Medicine

Zhukov, I.; Mochalov, M.; Poduvalov, A.; Cherevan, A.; Sorokin, A.;
et al.

Presented at Med-e-tel 2005 Conference in Luxembourg

<http://hdl.handle.net/123456789/3554>

Presentation

Downloaded from PRISM: <https://prism.ucalgary.ca>



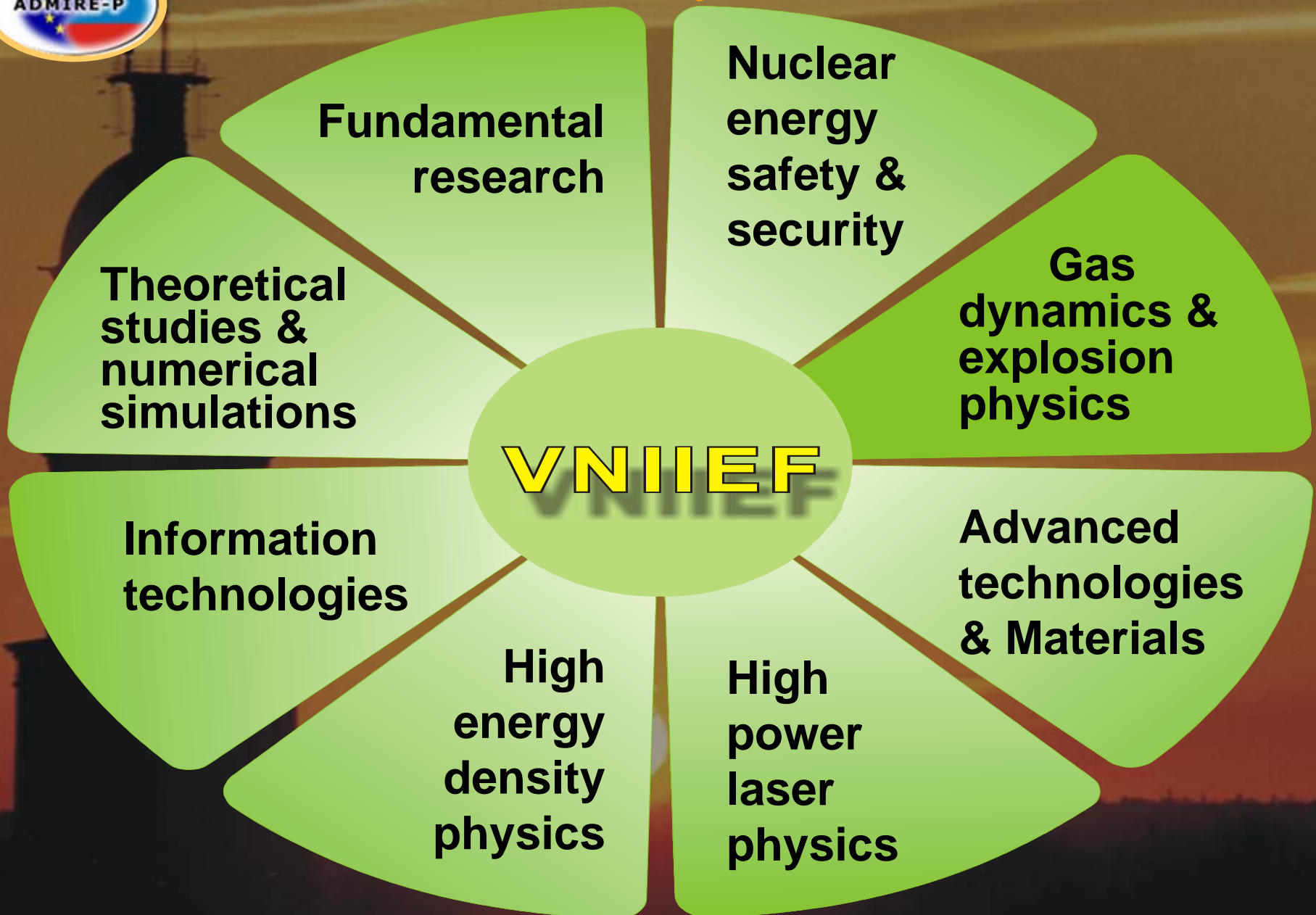
Application of Video Technologies and Pattern Recognition in Medicine

Presented by I.V. Zhukov

**Russian Federal Nuclear Center -
All-Russia Scientific-Research Institute of Experimental Physics
Institute of Nuclear and Radiation Physics**



Networked Audio Visual Systems and Home Platforms





Intelligent Video Systems and Image Processing Laboratory (VIP Lab, since 1973)

- *nuclear and laser physics experimental images processing*
- *image processing algorithms and software development*
- *specialized hardware development and perfection*
- *video surveillance for nuclear materials safety and security*
- *utilitarian video processing algorithms (object tracking, event detection, scene analysis, spatial measurements, features extraction)*



Technological basis:

- **CBIR (Content-Based Image Retrieval)**

*software tools and demo applications
developed within ISTC Project #2191.
IST FP6 Call 5 proposal*

- **SVS (Smart Vision Sensor)**

*pre-project research
IST FP6 Call 5 proposal*



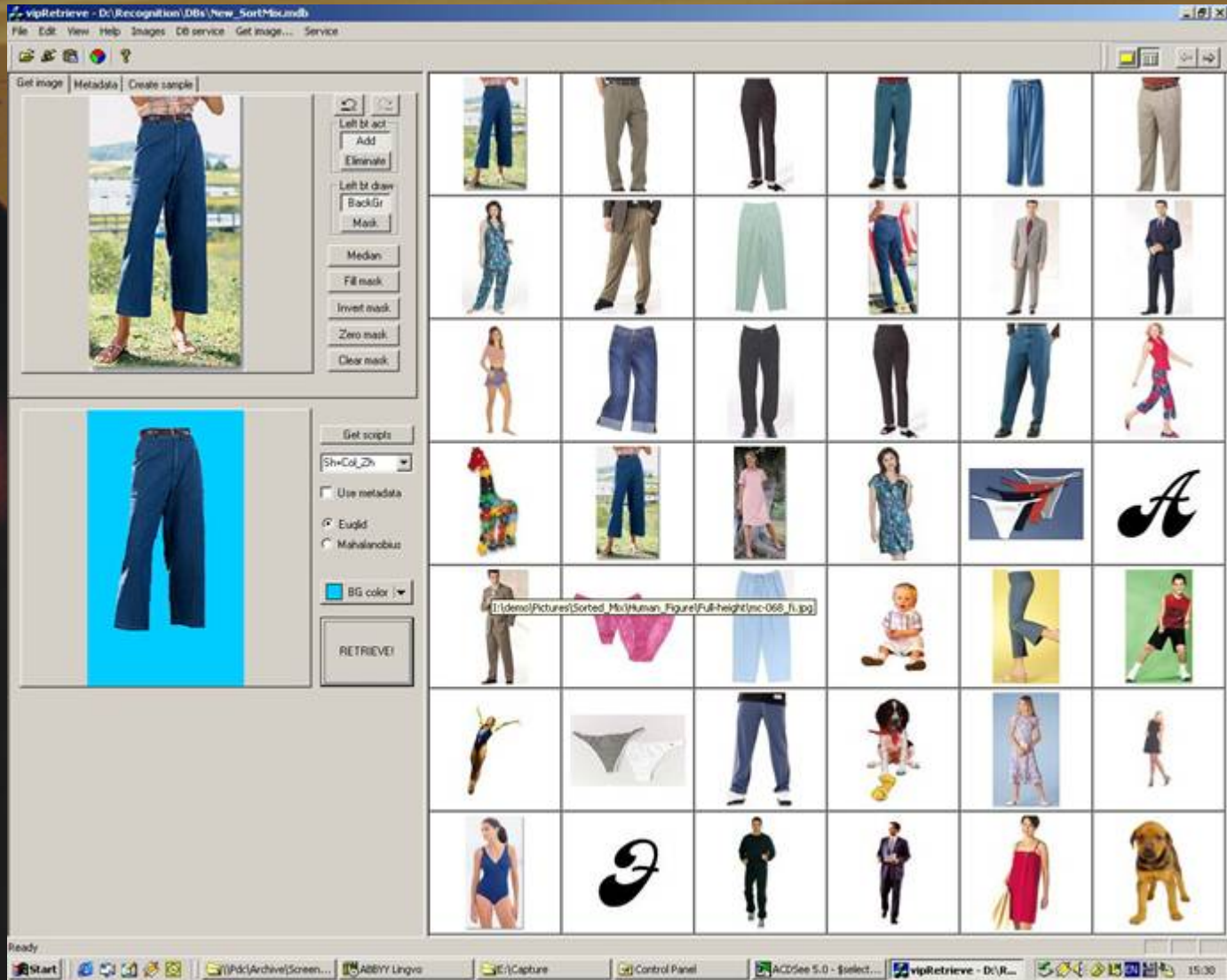
CBIR – what is it?

**Search for images similar to given sample image,
based on generic image content features
(not on textual descriptors!)**

*The same for objects on images or
groups (ensembles) of objects.*

**Features characterize
SHAPE + COLOR + TEXTURE.**

**Applicable to retrieval from Databases
of specific medical images**

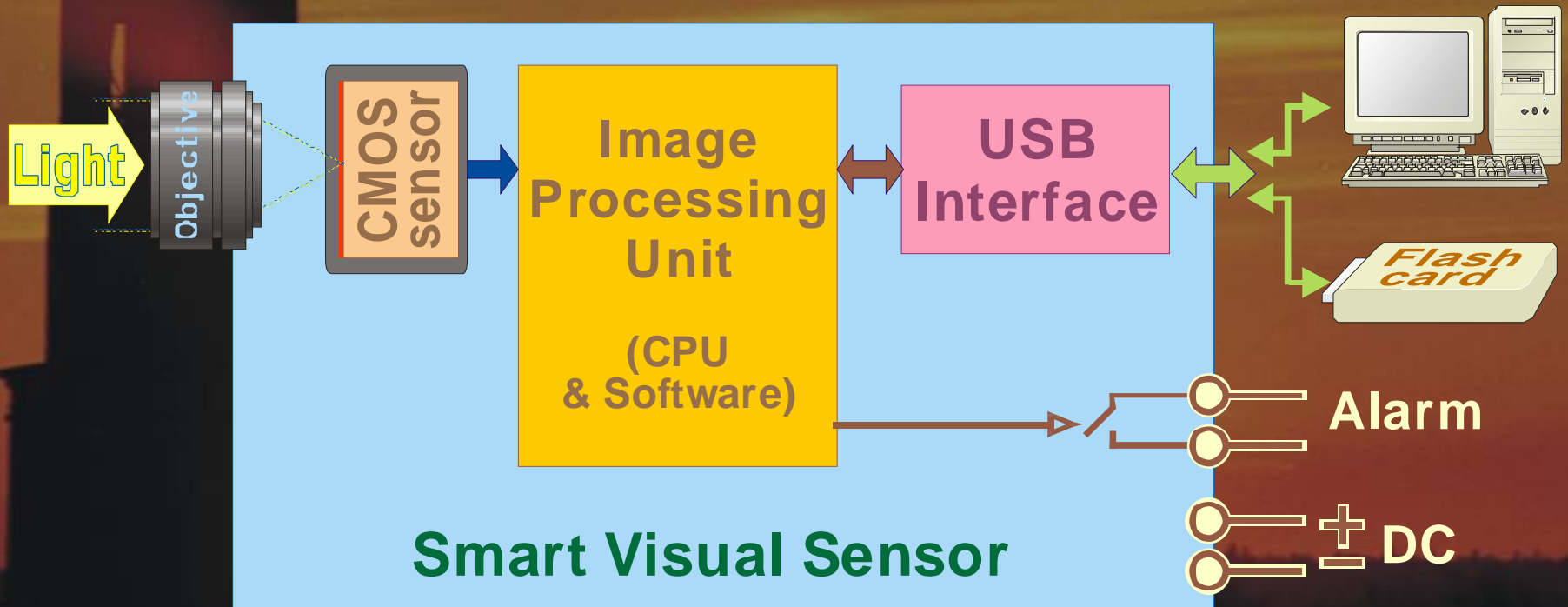


CBIR Retrieval example

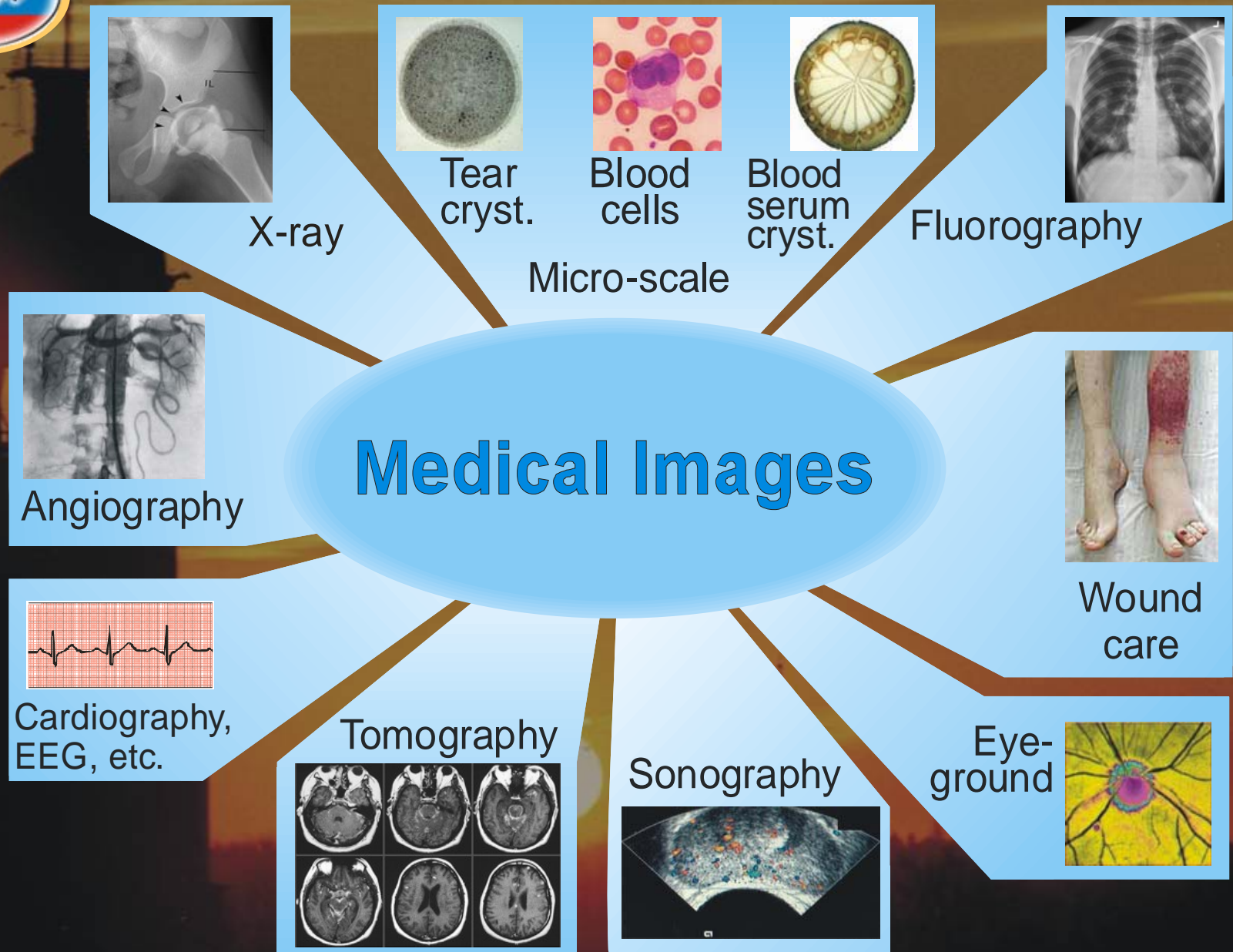
SVS – what is it?

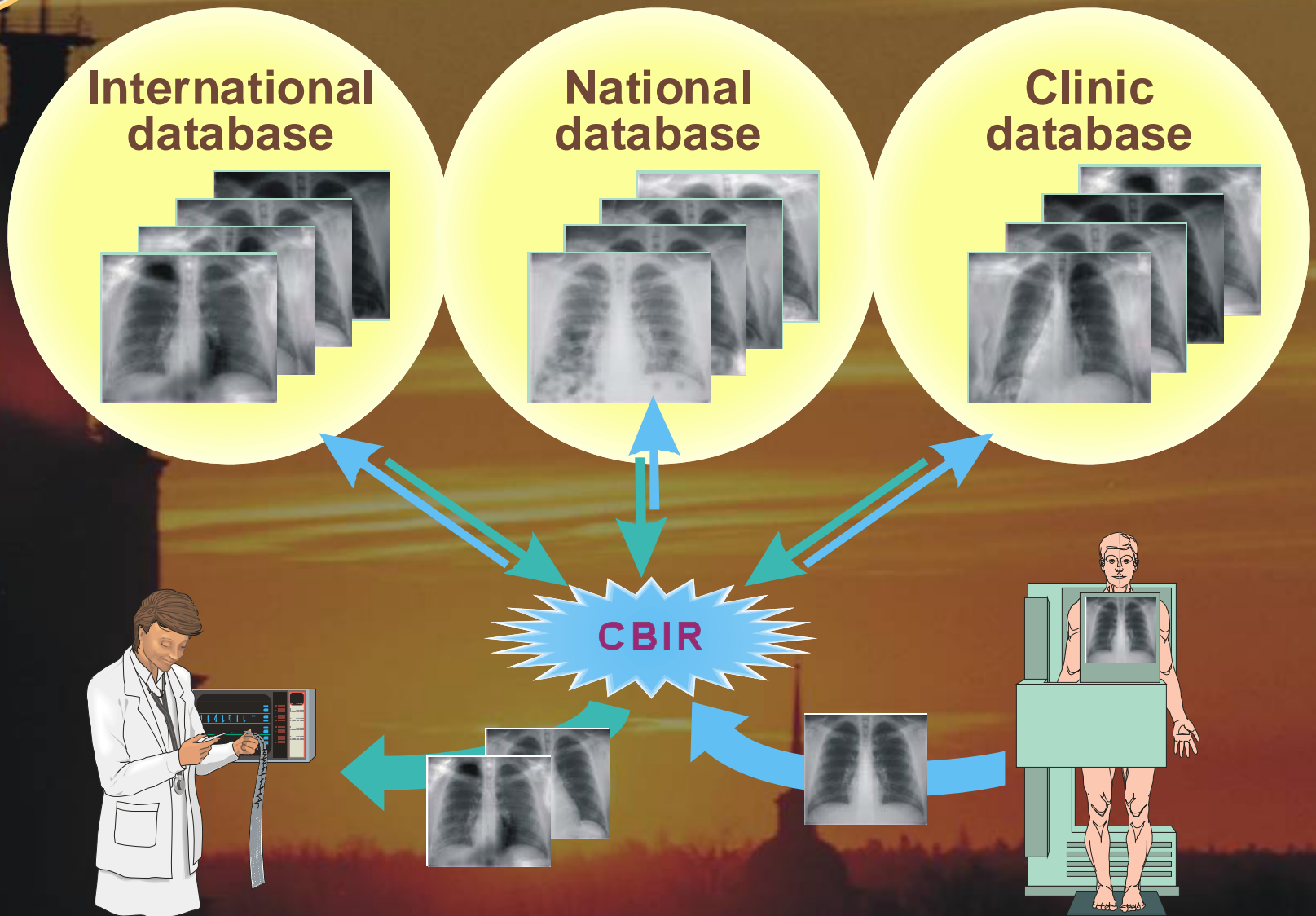
Portable camera with embedded powerful image processing capabilities

Re-configurable to run any applied image processing task

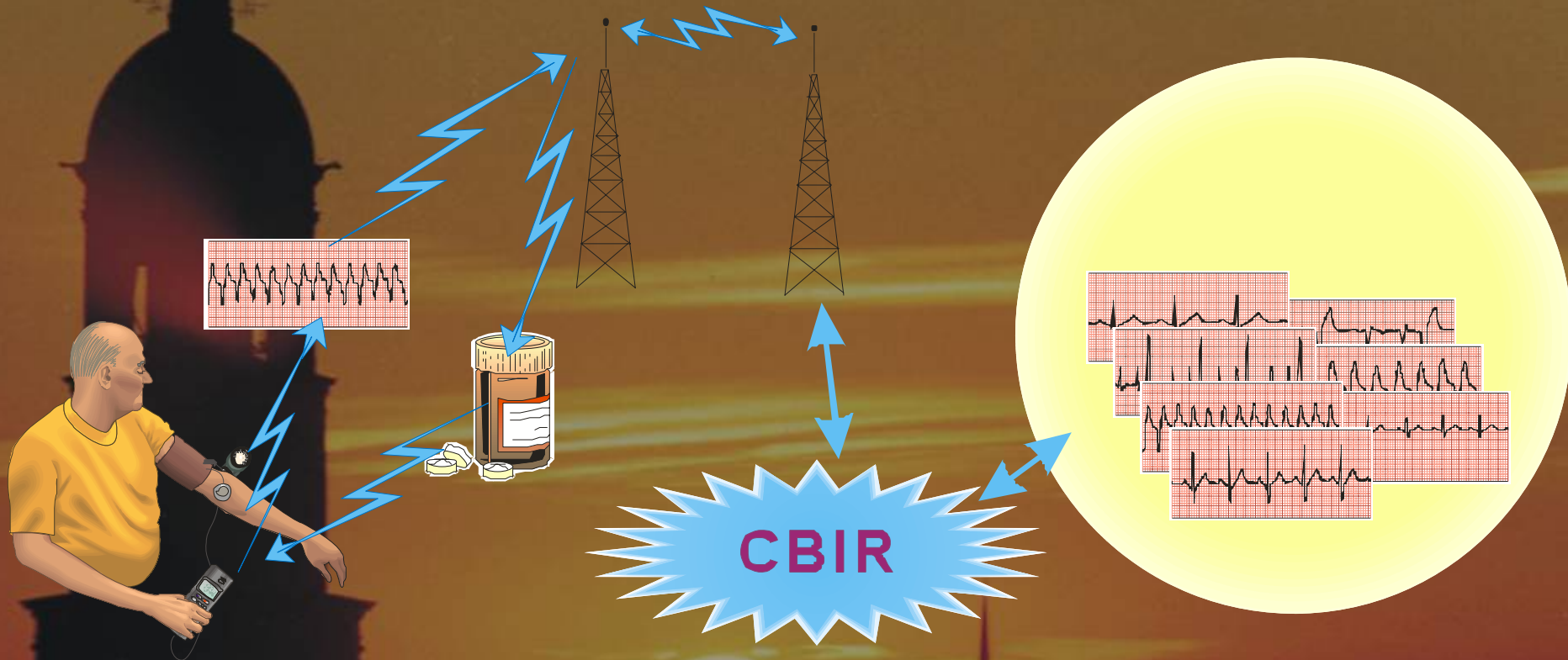


Applicable to remote medical intelligent imaging





CBIR application



CBIR in combination with SVS application



Innovative aspects

- *Similar epicrisis can be easily retrieved accompanied by desired metadata (treatment course, therapy results, etc.)*
- *CBIR retrieval based on Integrated biomedical data (not only images) is similar to diagnostics*
- *SVS allows Visual and other data acquisition and features calculation to form query for search just at patient location (remotely)*
- *Retrieved data delivered to a patient and/or a doctor (as assigned)*
- *Local (at medical institution) intelligent imaging, like chromosome analysis, blood cells, eyes tracking (including saccadic), etc.*



Project idea

- *SVS for broad application (hardware and software development)*
- *CBIR tools and applications development*
- *Medical applications based on CBIR and SVS*

Partner expertise required

- *Medical Imaging and image processing*
- *Medical images archiving and treatment (Databases)*
- *Mobile networking*
- *Internet-based services and applications*



Contact

Igor V. Zhukov
007 83130 44466
zhukov@vniief.ru