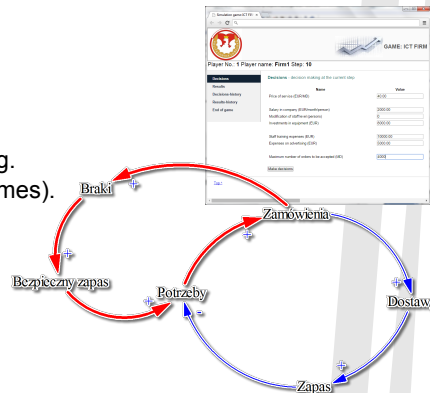**Cloud computing, grid computing**
Cloud processing of big data basing on Hadoop.
The influence of virtual machine manager
on cloud and grid systems performance.

Institute of Computer Science
Lublin University of Technology

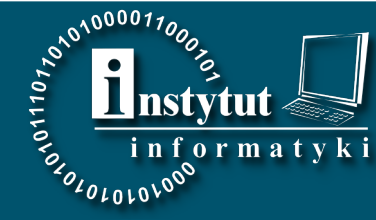## Lines of research and the possibilities of cooperation

Modelling and simulation
Creation of dynamical simulation models
of enterprises and their systems.
Efficiency analysis of actions. Processes reengineering.
Elaboration of simulation decision games (Serious Games).

**Human motion acquisition
(motion-capture)**
Resampling and interpolation of motion data.
Hierarchical human model.
Motion detection and recording using mobile devices:
 - Acceleration, location and orientation change recording.
 - Collected data analysis.
 - Detection of specific user actions.
3D motion acquisition (professional motion capture system):
 - Ground reaction forces (2 force plates).
 - Electrical muscle activity recording (wireless EMG system).
Natural user interfaces design.

2D and 3D graphics
Applications of graphics in digital reconstruction of historical city appearance.
Modern human-machine interfaces, image and gesture recognition.
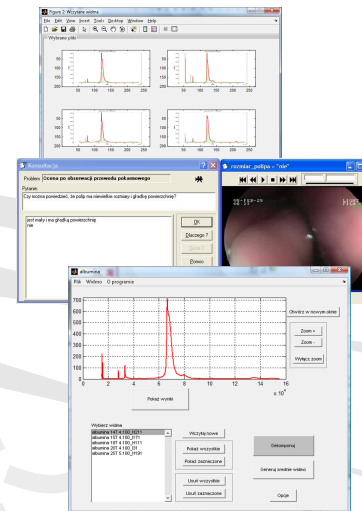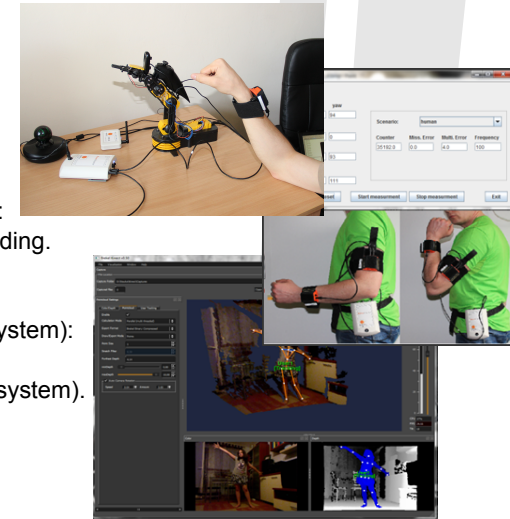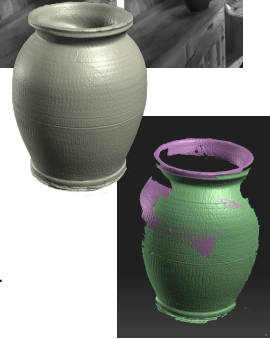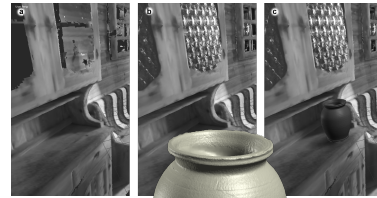Application of gamification in didactics and vision diagnosis.

Bioinformatics
Multivariate analysis of mass spectrometry data
using normal distributions and statistical methods.
 - data preprocessing (normalization, noise reduction,
   baseline correction, correction of outliers,
   calculation of the mean spectrum).
 - Gaussian Mixtures decomposition.
 - Data classification.

and many other...

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e-mail: inst-inf@pollub.pl   www: http://cs.pollub.pl

3D scanning and model analysis of heritage objects

Research on:
- Selection of 3D scanning techniques for museum needs.
- Elaboration of on-line presentation methods for virtual exhibits.
- Elaboration of algorithms facilitating a process
  of fragmented artifacts reconstruction.

Eyetracking

Testing usability and accessibility of computer application interfaces
(desktop, web and mobile)
Adjusting interface for people with disabilities
Optimizing application interfaces ergonomics to enhance user productivity
Analysis of navigation and control panels ergonomics
Advertising testing, testing design and placement
of product label and package, shelf testing
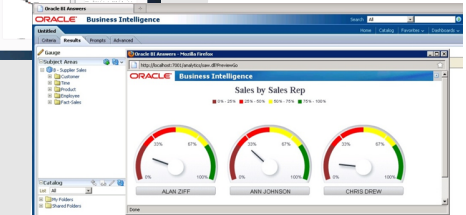Analysis of eye movements for medical diagnosis
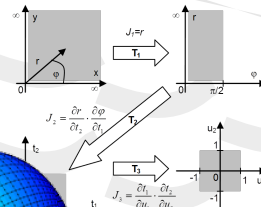
ukrywane
dane
lub
znak
wodny

Steganography

Information hiding tasks:
- Watermarking
- Secret communication
- Hidden volumes
- Additional information attachement.

Data warehousing and business intelligence systems (BI)

- Demonstration the usefulness of BI systems to manage a modern
  organization in different business areas
- Popularization the idea of business intelligence in today's organizations
- Rating of maturity of contemporary organizations to adopt modern BI systems
- Identification of benefits, barriers, and determinants of implementation
  of BI systems
- Data warehouse design and implementation
- Design and implementation of BI systems to support decision making
- Evaluation of the usefulness of existing BI tools in business analytics
- Implementation of BI tools to support decision-making processes

Boundary Element Method modifications

Development of special boundary elements
and different numerical methods
applied in Boundary Element Method
and Finite Element Method
used mainly for computer tomography.