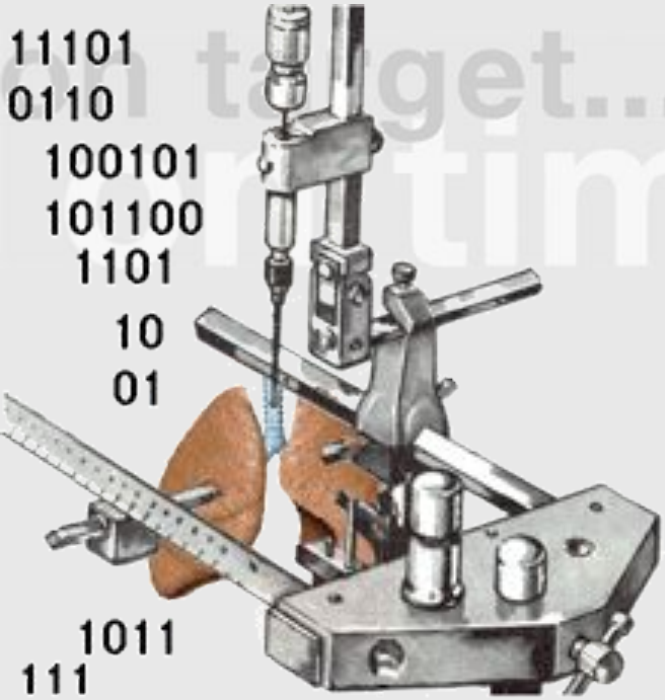
IntelliSoft

Imitation of Biological Processes

Medical Simulations and Analysis



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Intellisoft Ltd.
tel.: +7 (095) 366 27 03
email: infor@intellisoft.ru

Imitator - Introduction

- Human body simulation software, developed in the Vinnitsa State Medical University (Ukraine)
  - Modeling of all the internal biological processes
  - From internal parts (organs) down to a cell level
  - Customizable biochemical model of each organ
  - Interrelation between organs
  - Influence of the environment and other initial conditions

The concept of simulation

- Step-by-step simulation of each organ.
- Mathematical model of organs are based on biochemical and fermentative equations.
- Initial conditions and parameters of organs allow simulating of a given case (disease).
- Average values of parameters are provided in the application database.
- Parameters are updated either by a user, or by the simulation engine.
- A change of any parameter (direct or indirect) cause the “chain updates” of other parameters.

Scope (internal processes)

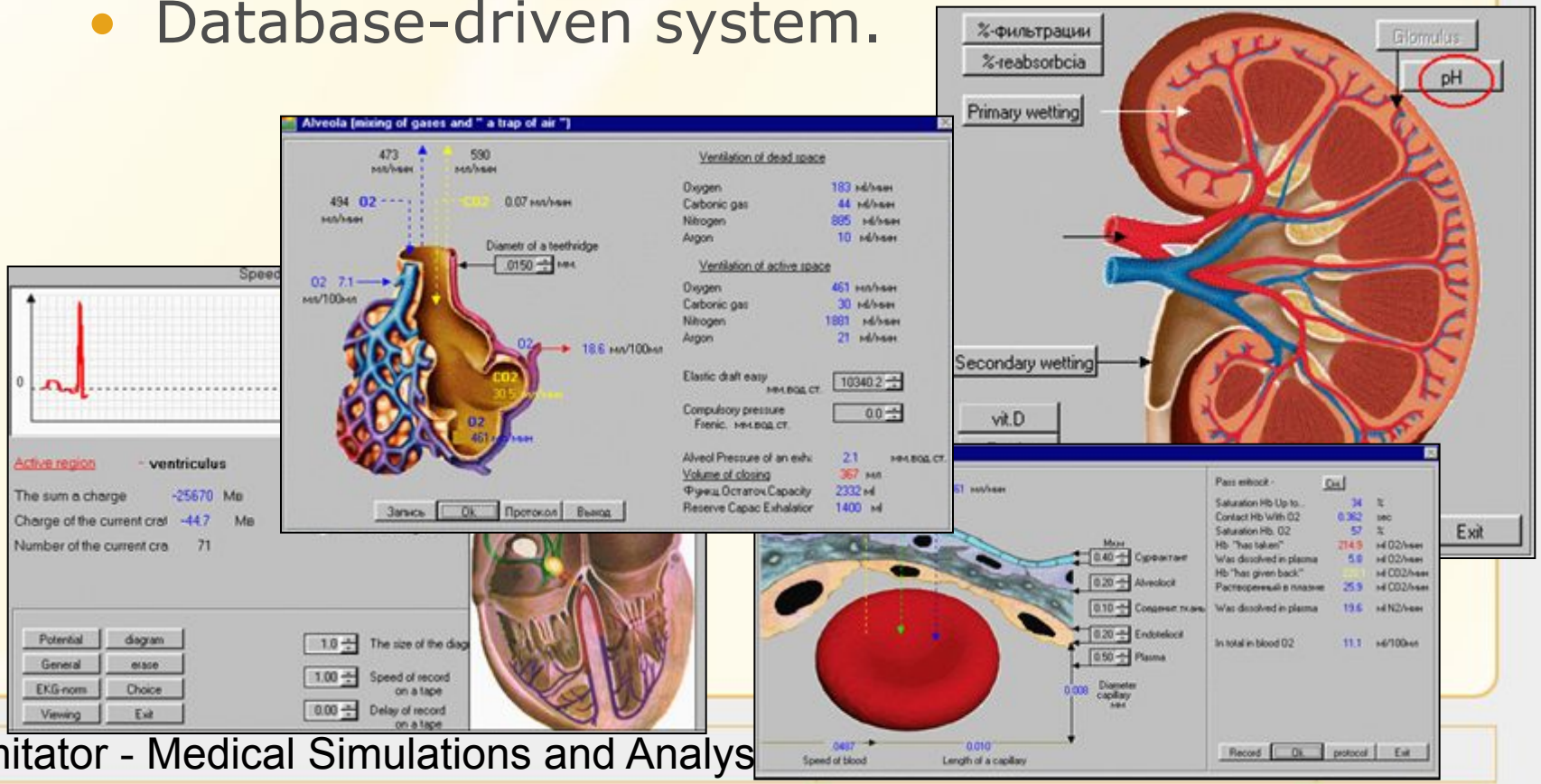
- Interlocking model of main organs, providing a simulations of core processes:
  - metabolism (e.g. biochemical transformations of food, hormones; synthesis of all proteins)
  - blood circulation
  - breathing
- Drug influence on each organ

Scope (external factors)

- Environment
  - temperature, partial pressure, oxygen pressure, carbon dioxide pressure, nitrogen pressure, air humidity, sun UV, regions time zones
- Nourishment
  - food products and ingredients (proteins, fats, carbohydrates, electrolytes, aminoacids, fatty acids, cellulose, collagen, casein etc.), diets, sugar substitutes used in diabetes etc
- Energy expenditures
  - manual labor

Implementation

- Advanced graphics user interface (GUI) based on visual models.
- Customizable mathematical models.
- Database-driven system.



How it works

- Lunch the software
- Create (or load) a profile
  - set up the environment (temperature, weather etc)
  - edit individual properties (weight, sex, age etc)
  - define a pathology or disease (optional)
  - select food or drugs (optional)
- Run simulation
  - 24 hour simulation takes few seconds
- Observe the result
  (new values of parameters)

Applications

- Modeling biological processes
- Modeling human diseases
- Modeling the effect of drugs and the environment on an organism
- Modeling medical equipments (e.g. anaesthesia machine is included)
  - built-in medical hardware and software

- Industries:
  - Education
  - Health care
  - Research and Development

Availability

- Working system is available for
  - Windows platform
  - Web-based access
- English and Russian versions
- Commercial product can be developed in a matter of a month to meet the specific customer requirements

More Information

- Imitator web site
  - http://www.simanest.org/medsim/

- Contacts
  - **Eugene Bondarshuk** (Technical enquiries)
    email: geny@rp.km.ua
  - **Nikolai Ptitsyn** (Sales enquiries)
    email: np@intellisoft.ru
    cellular: +7 902 1594229

Contact Information

Intellisoft Ltd.

33, prosp. Budennogo,
Moscow, 105275, Russia

Phone: +7 095 3662703

Corporate email: info@intellisoft.ru

Web site: http://www.intellisoft.ru/