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Computer support system for planning orthopedic operations based on the analysis of computed tomography images

COUNTRY OF ORIGIN	IDENTIFIER	PUBLISHED	LAST UPDATE	DEADLINE
Belarus	BO4438	2021-11-05	2021-11-05	

Linked profile in other language

Система компьютерной поддержки планирования ортопедических операций на основе анализа изображений компьютерной томографии

Responsible

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Summary

The United Institute of Informatics Problems (UIIP) offers consumers a computer support system for orthopedic surgery planning with the analysis of computed tomography images on the basis of an outsourcing agreement and is looking for partners to conclude a distribution service agreement.

Description

The UIIP NAS of Belarus has developed a system that allows you to select bones in the image and build their three-dimensional model. Using this model, the developed operation planning module allows calculating the most appropriate parameters for performing the operation and performing virtual cutting and correction of the bone model.

The system allows you to select bones in the image and build their three-dimensional model. Using this model, a special operation planning module allows calculating the most appropriate parameters for the operation and performing a virtual cutting of the digital bone model. At the stage of planning operations, the System allows calculating the parameters of the surgical intervention based on the markers placed by the user, defining the position of the anatomical landmarks, which are used to calculate the geometric characteristics of the bones.

At the moment, software tools have been developed for planning oblique and rotational osteotomy of the hip, planning surgical treatment of some types of lesions of the forefoot and wrist.
An additional feature of the System is the export of models of segmented objects to XML files.

The system is a fundamentally new development, thanks to the ability to simulate the operation (rotary osteotomy) and predict its possible consequences even at the planning stage.
Compared to existing analogues, the System has the following advantages:
* does not require connecting a computer to a tomographic scanner (when planning an operation using the System,

the user frees up the tomograph's time for scanning other patients);
* provides the user with a large selection of tools for viewing tomographic images with the ability to carry out measurements and calculations necessary for planning an orthopedic operation;
* has a flexible approach to scheduling operations (the ability to both automatic and manual setting of the operation parameters).

The system may also be of interest to medical schools as a computerized surgical orthopedic simulator.

Advantages and Innovations

* The time for planning an operation using the System is significantly less than when planning with traditional methods using radiographs.
* The System user has the ability to plan an operation using traditional methods using simulated radiographs.
* The system makes it possible to carry out the operation on a virtual model, which allows the orthopedist to assess the possible consequences of the operation even at the stage of its planning. When modeling an osteotomy, the orthopedic surgeon can not only select different cutting tools (one- and two-plane incisors), but also customize their sizes.

Stage of development

Field tested/evaluated (TRL8)

Comments regarding stage of development

A prototype of the System has been implemented in the following medical and medical educational institutions:
* Republican Scientific and Practical Center of Traumatology and Orthopedics;
* Belarusian Medical Academy of Postgraduate Education;
* Belarusian State Medical University;
* 6th Clinical Hospital in Minsk.

Funding source

State budged
Internal

IPR status

Secret know-how

Sector group

Healthcare
ICT Industry & Services

CLIENT INFORMATION

Type and size of client

R&D institution

Year established

1965

NACE keywords

J.62.0 - Computer programming, consultancy and related activities

J.62.02 - Computer consultancy activities
M.72.19 - Other research and experimental development on natural sciences and engineering
M.74.90 - Other professional, scientific and technical activities n.e.c.

Turnover (in EUR)
10-20M

Already engaged in transnational cooperation
Yes

Additional comments
Cooperation with foreign universities, research centers and organizations in the field of informatics, implementation of joint international projects and programs.

Languages spoken
Russian

INFORMATION ABOUT PARTNERSHIP

Type of partnership considered
Distribution services agreement
Outsourcing agreement

Type and role of partner sought
Consumers of the computer support system for the planning of orthopedic operations with the analysis of computed tomography images on the basis of an outsourcing agreement.
Partners for the conclusion of an agreement on distribution services.

Type and size of partner sought
University