

med  app

Cut: SMART
Mode: LOCATE

**Empower people for
better health**



Why doesn't the world go forward without us?

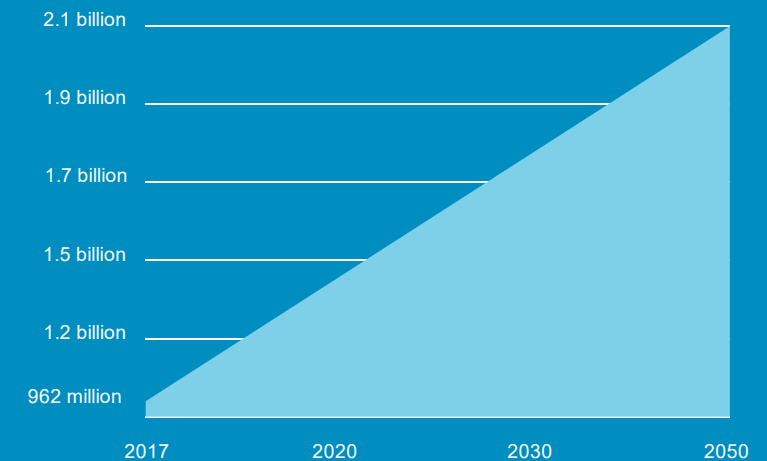
Big data analytics and artificial intelligence will be rapidly gaining in importance in modern medicine.



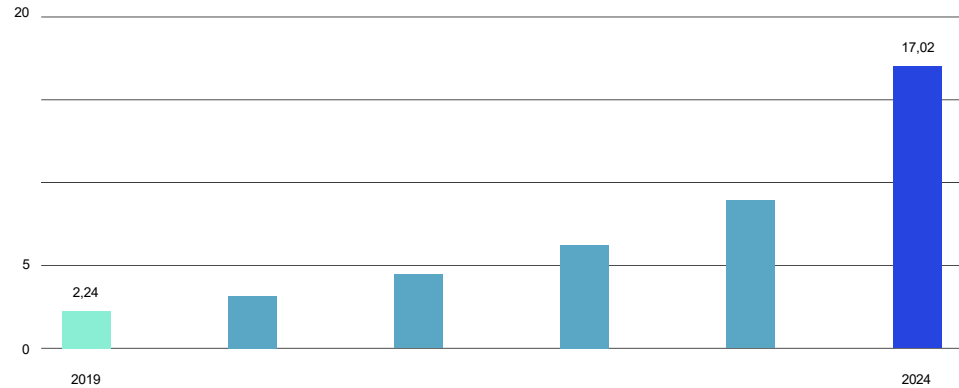
2.1 bn Projected number of people aged 60 and above in 2050

According to UNO data

In 2017 the global population aged 60 and above was 962 mil, and it is expected to grow to 2.1 bn by 2050



The use of tools for analysing large data sets (big data analytics)
In health care (bn USD)



Source: The Artificial Intelligence in Medicine Market Growth, Trends and Forecasts, mordorintelligence.com

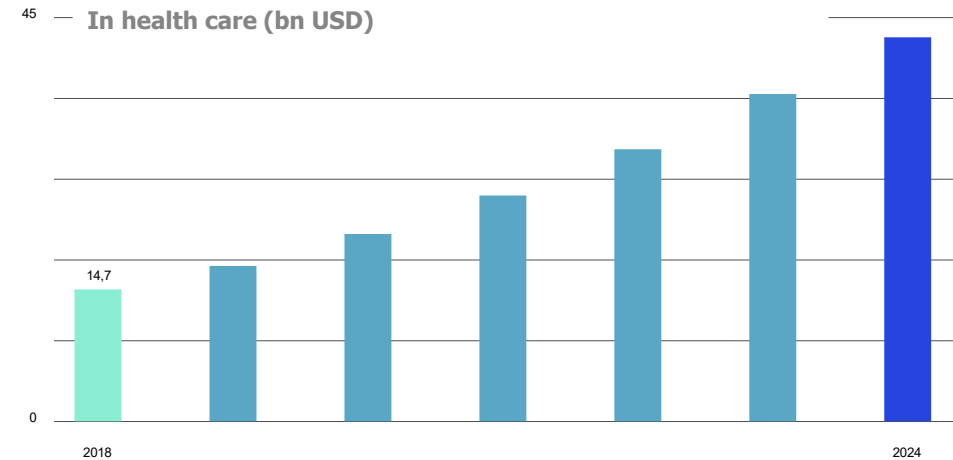
CAGR: 19.9%

Forecasted CAGR of the telemedicine market value
in North America in 2019-2026 **

**North America Telemedicine Market 2019-2026, researchcosmos.com

> CAGR: 40.2%

The use of tools for analysing large data sets (big data analytics)
In health care (bn USD)



Source: Global Big Data in Healthcare Market - Competition, Forecast & Opportunities, 2024, reportlinker.com

CAGR: 16.7%

Forecasted CAGR of the telemedicine market value
in Europe in 2019-2024 *

*Telemedicine Market 2016-2024 - Growth, Trends and Forecasts, mordorintelligence.com

> CAGR: 20%

Market outlook

6.0 %

Forecasted average annual increase in the number of diagnostic imaging procedures in the USA in 2019-2024. *

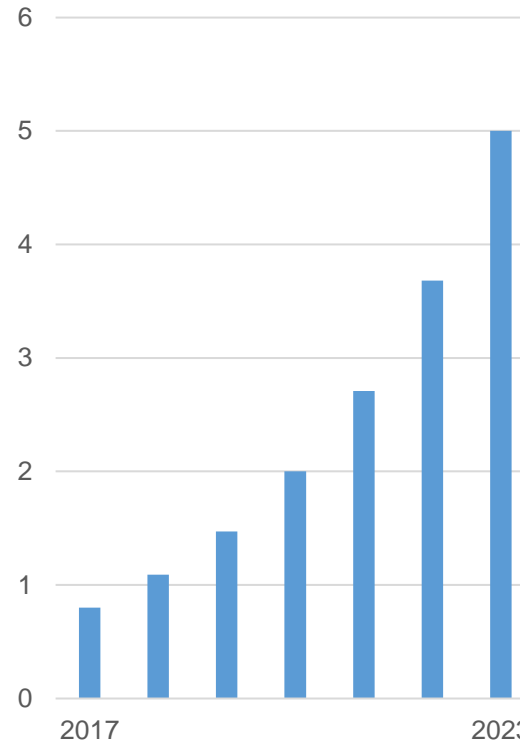
*US Diagnostic Imaging Market 2019-2024 - Growth, Trends and Forecasts, mordorintelligence.com

5.6 %

Forecasted average annual increase in the number of diagnostic imaging procedures in the European Union in 2019-2024. **

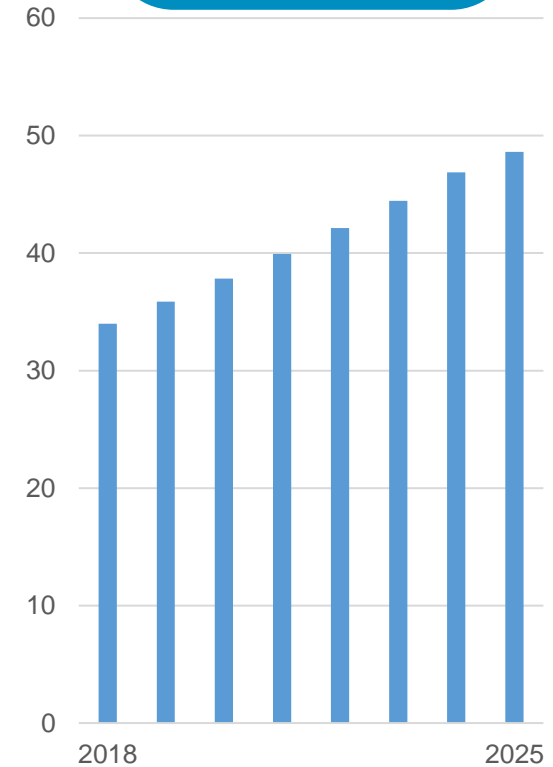
**Europe Diagnostic Imaging Market 2019-2024 - Growth, Trends and Forecasts, mordorintelligence.com

CAGR: 36.6%



Global VR/AR medical solutions market 2017-2023 (bn USD)

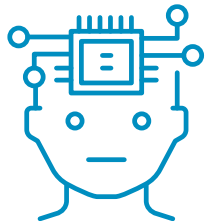
CAGR: 5.2%



Global diagnostic imaging market 2019-2024 (bn USD)

COOPERATION OF SCIENCE AND BUSINESS, IS A KEY TO SUCCESS

We are innovative company, offering unique solutions of supporting graphic's diagnostic and new generation of telemedical services. Telemedicine, based on technology which enables remote monitoring of medical condition and innovative visualization of data in Mixed Reality is one of the fastest growing industries in the world.



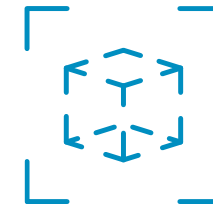
ARTIFICIAL INTELLIGENCE

Constant improvement in disease diagnosis quality and continuous envelope through use of modern IT tools.



BIG DATA ANALYSIS

Analysis of aggregated data through the use of many peripherals devices and their operate in innovative telemedical system.



3D IMAGERY

Mixed Reality technologies (MR) and Augmented Reality (AR) to improve diagnostic and treatment.

Cooperation with international concerns



- + Using secure Azure cloud to store the medical data
- + Relevant medical support for work on authorial project MedApp CarnaLife Holo



- + Joint streaming data project from Vivid95 Echocardiograph in real time



- + Joint project of cardiac patients screening paying special attention of arrhythmia detection
- + Project carried on 2000 patients

TEAM



Krzysztof Mędrala

CEO

Has wide experience in working with international organizations in the area of development, sales, marketing and restructuring of companies. In his career he took part in many transactions M&A (i.a. Euro Bank S.A., TU and TUnZ Europe, Casus Finanse S.A.) Before he became a chairman of the board, he managed the investment fund specialized in Venture Capital area.



Rafał Ligęziński

Vice- president of the management board

Has many years of experience in applying solutions using modern technologies in medicine, which he achieved in both, Poland and abroad .
In the past he was responsible for sales of modern medical services on polish and foreign market.
He worked i.a. for Medivover, Oracle (Helthcare/Life Science), SonoSite (fujiFilm) and Famed.



Michał Adamczyk

Telemedical Director

Manager of IT projects with medical background. 9-years of experience in telemedical industry. Architect of telemedical systems and algorithms to biomedical data analysis. Responsible for certification of medical products processes – CE and FDA. MUW and WUT graduate and currently participant of postgraduate studies Executive MBA. Worked i.a. in Medicalgorithmics and Infoscan.



Andrzej Skalski

Business Unit Holo Director

Has a wide of experience in leading and realization of tests and development projects, financed by domestic and foreign funds. He specialized in processing and analysis of medical images. Dsc. eng in biomedic engineering, professor of AGH.

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**TELEMEDICAL
PLATFORM**

 carnalife
SYSTEM

Innovative device to remoting registration of medical data, allowing in effective way collection and analysis.

Analysis of data are supported by intelligence algorithms. If the test requires special interference of specialist, it will be appropriately prioritize

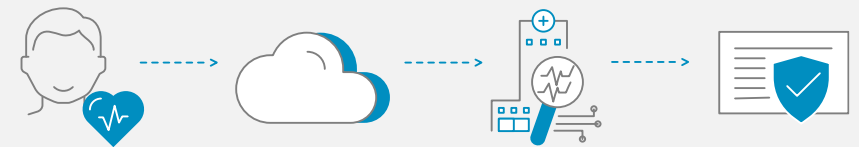
- + Tools allowing remote patients monitoring
- + Expedient diagnostic evaluation
- + Telemedical solutions cooperate with many types of diagnostic devices, independently from manufacturer
- + Storing medical data in digital form
- + Tools for screening test
- + Easy integration with collecting data systems or clinic software
- + It allows for import files of any extension and save them in electronic documentation of patient



Easy to use tool for remote patient's health monitoring of different specialization

Patient, due to our application and telemedical devices (or manually) implement medical data, creating EHR (Electronic Health Record). Data in cloud are encrypted, analysed and archived. All tests, which are given to CarnaLife System create medical documentation. Documentation is available from each place in the world.

Patient remotely do a test. Their results getting into cloud, where are analysed using algorithms of artificial intelligence. Medical facility verify analysis result



If the test result is incorrect, establishment may react properly.



It reduce amount of interferences— specialists react only when it is necessary

Open tool to operate electronic documentation and remote test analysis



CONNECTION

Connection with P1 project (e-recipe, e-sick leaves) and possibility of integration with platform for teleadvice



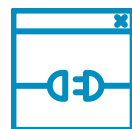
INTEGRATION

Possibility for connection of different telemedical devices from different manufacturers



WITHOUT LIMIT

Scalable diagnostic solution without limit of registered patients and without limit of processing data



API

Opened API protocol for communication with HIS systems and clinic software

Available examination types



ECG



Body composition monitor



Spirometry



Pulseoximetry



Body weight



Laboratory test



Body composition analysis



Blood pressure



Hearing test



Glucose measurement



Nutrition



CT



Radiology test



X-RAY



Pulse



MRI



CTG












Temperature

Examination may arbitrary turn on and off
dependence of medical establishment

Tool for coordinate benefits as part of basic health care – prevention and treatment of chronic disease

SUGGESTED TESTS (POSSIBILITY OF TURNING ON AND OFF)

- | | | | |
|---|---------------------------|---|-----------------|
|  | ECG |  | Temperature |
|  | Blood pressure |  | Laboratory test |
|  | Body mass |  | Spirometry |
|  | Dermatological test |  | Pulse oximetry |
|  | Glucose value measurement | | |

CarnaLife System allows for carrying on in-depth assessment – long time of monitoring at home condition, gives to achieve more and more information about patient's health.

Storing all information in one place and further diagnosis of people chronically disease – allows for the full, permanent diagnosis and quick treatment correction.

Using of our solution allows the fastest diagnosis of patients, detecting diseases, which may be particularly dangerous.



Modularity of our tool allows addapting its for requirments of many specialisation.

Here are some of possible configurations:

Cardiology									
General practitioner/pediatrician									
Diabetology									
COVID-19									
Dermatology									
Radiology									
Pulmonology/aleriology									
Otolaryngology									
Gynecology/Midwifery									
Rehabilitation									



Target users

PATIENT



Medical establishment

Pediatrician, general practitioner
(Family medicine, BHC)

Teleradiological lab

Rehabilitation lab

Outpatient Specialist Care (OSC)

Nursing home (including elderly)

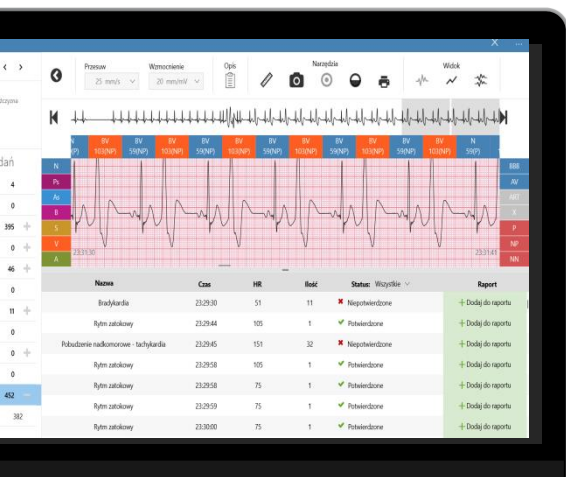
Hospital

Telemedical center

Training center

Quick analysis of ECG test due to advanced software. Support for cardiological algorithms based on artificial intelligence.

CarnaLife System allows for quick analysis of ECG signal from Holter and Event Holter tests with high effectiveness. High effectiveness of algorithms resulting in reduction of specialists working time for test.



Algorithms preparing complete test report – if the physician want to verify a signal and diagnosis, CarnaLife System will also make it possible.

Algorithms sensitivity*

98,78%

Rhythm detection

95,50%

Supraventricular events, artrial fibrillation

95,50%

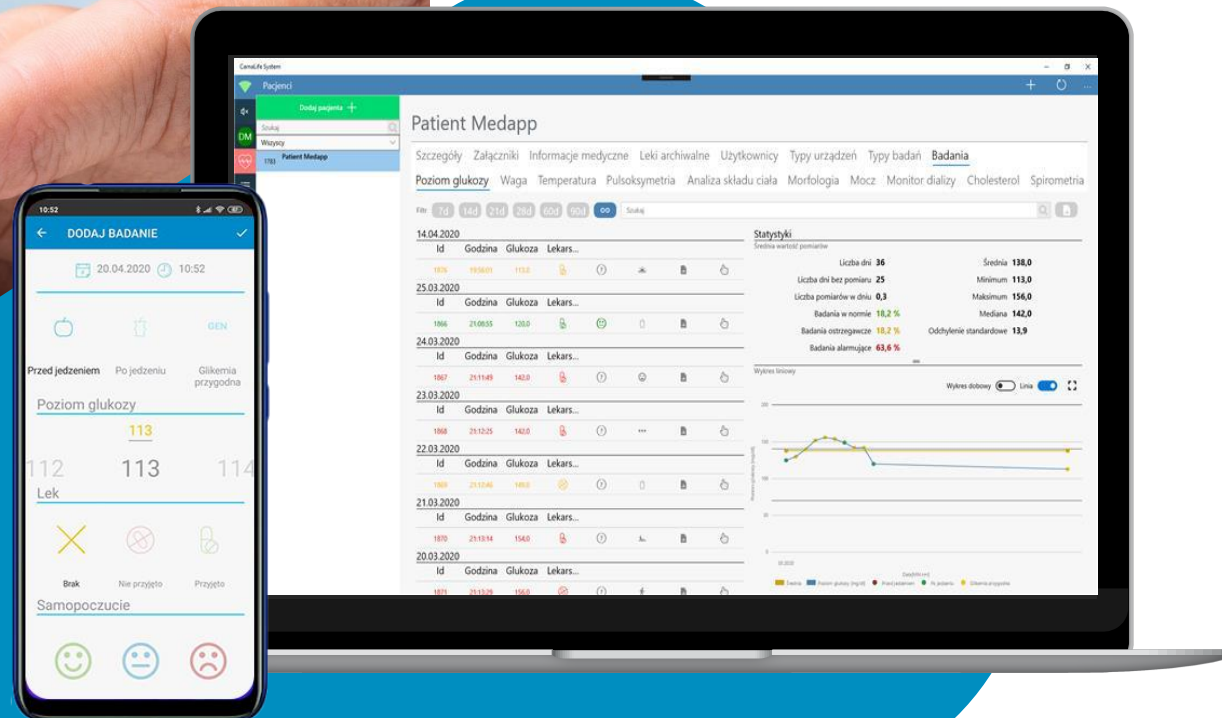
Ventricular events

*Based on reference bases MIT-BIH and AHA

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Monitoring of measured glucose value due to conventional glucometers or those fitted with Bluetooth

Clear elevator pitch of values measured with value indication deviate from norm.



CarnaLife System

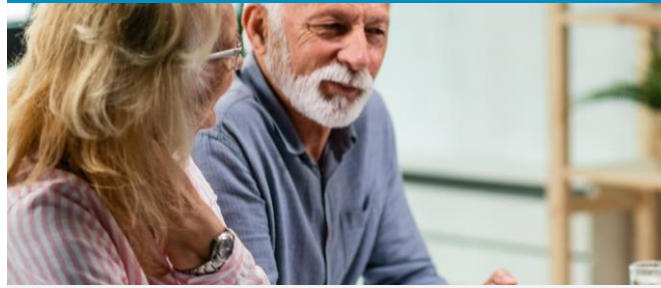
Telemedical platform for longer monitoring data collection, AI based analytics and clinically actionable reports and patient feedback

Doctors



- + Patient refund for longer telemedical monitoring. The norm is if you look longer you may find more
- + Ability to see the results from patients at any time
- + Intelligent algorithms and pre-defined alerts
- + Users administration (doctors, nurses, patients)

Patients



- + Registration for use with telemedical devices Bluetooth and GSM
- + Receiving tests results and feedback from doctors
- + Notifications and alerts
- + Device agnostic platform

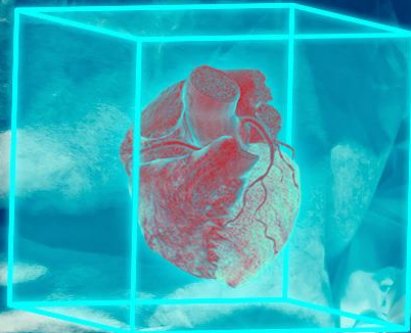
Cloud



- + Microsoft Azure – Cloud operating 24/7/365
- + Data encryption and protection
- + Automatic analysis and interpretation of the results
- + Archiving of medical data

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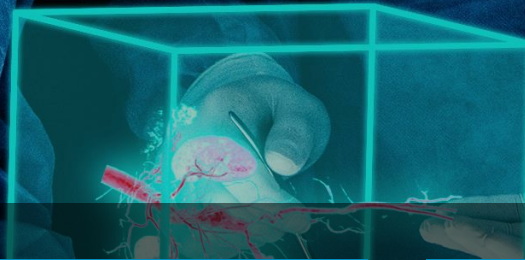
CarnaLife Holo



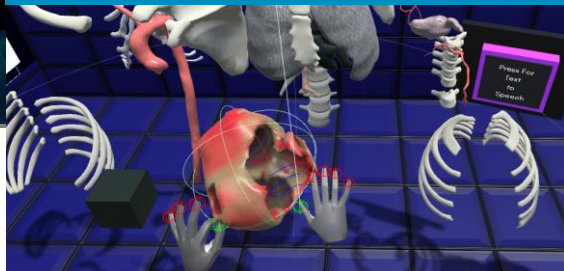
MIXED REALITY

Wide application of **mixed reality**

Cut: SMART
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**COURSE FOR
PHISICIANS AND
STUDENTS**



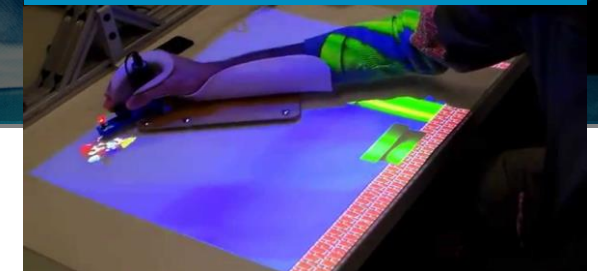
**VISUALIZATION
DURING TREATMENTS**



**TREATMENTS
PLANNING**



**PATIENTS
REHABILITATION**





CARNALIFE HOLO



Microsoft Partner

Mixed Reality

Holographic visualization of imaging patients data

DICOM 3D DATA



Acquisition of imaging data e.g. CAT scan, MRI scan, PET, Echocardiography, 3D angiography

PC/CLOUD VISUALIZATION



3D visualization

MIXED REALITY



Holographic visualization

PACS >

< synchronization

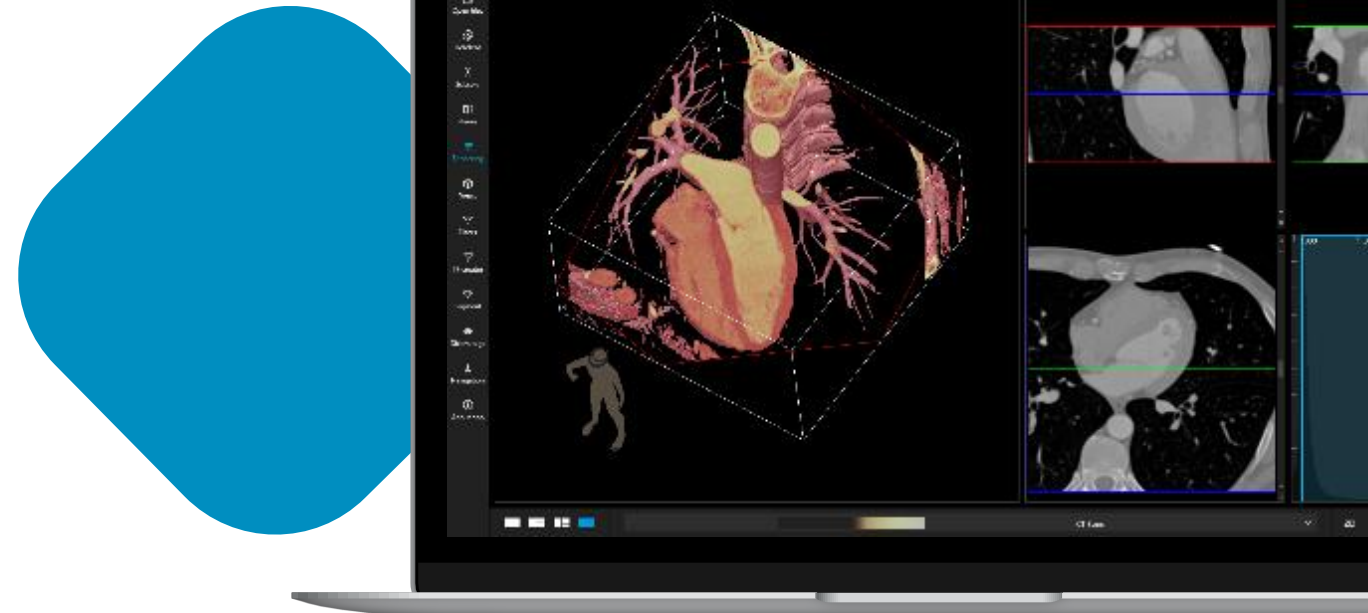
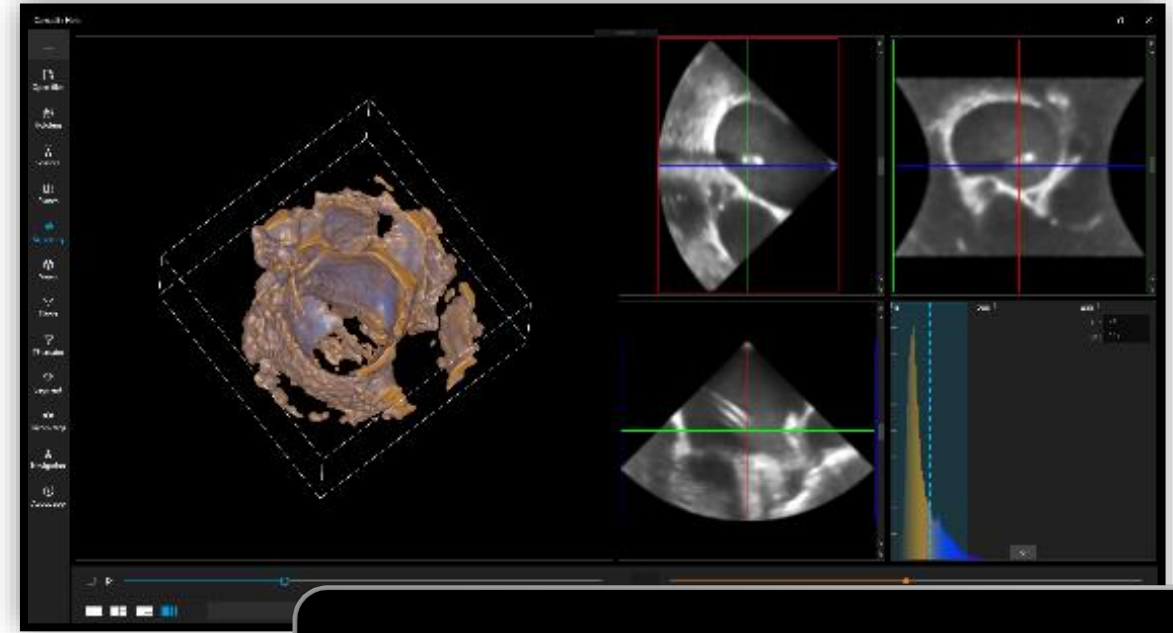
CARNALIFE HOLO

Main features:

- + Operate of data in DICOM standard
- + Holographic visualization of 3D
- + Interaction with hologram using gestures and voice commands

Additional features:

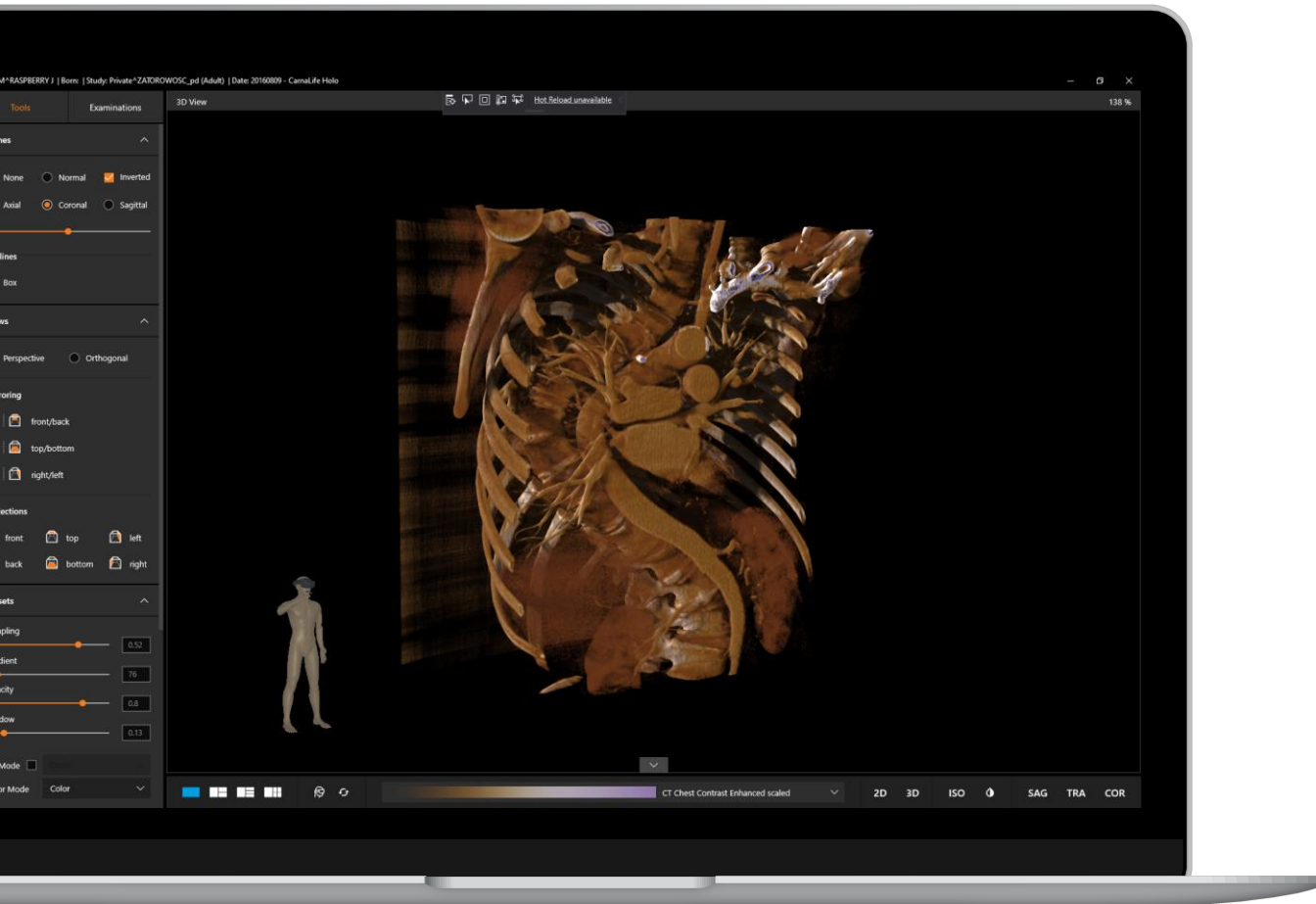
- + Cooperation with hospital PACS systems
- + Tools for define area of interests (scissors)
- + Transferring functions wizard, dedicated filters for particular tasks
- + Possibility of data display in real time from GE Vivid E95



CARNALIFE HOLO

- Interaction with the hologram

- + Interaction with the hologram without losing sterility, due to voice commands and gestures
- + Full 3D visualization
- + Possibility of integral surface generating in (smart cut) data
- + Zoom in and out of hologram
- + Possibility of accosting hologram at any place





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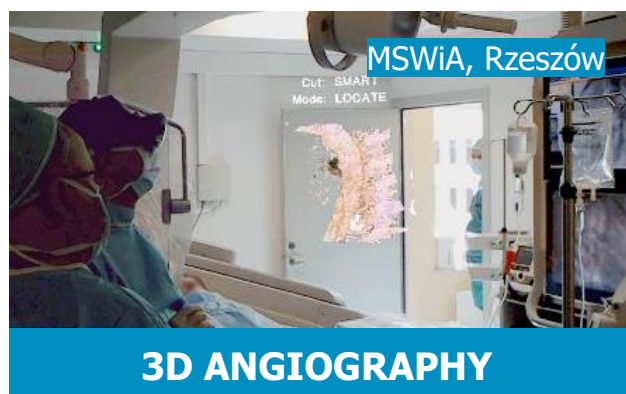
Echocardiography – Holography in the real time

- + Possibility of moving and placing holograms at any place
- + Interaction with the hologram, due to gestures and voice commands
- + Lack of losing sterility during interaction with the hologram
- + Independent verification of data
- + Broadcast delay < 80ms



EXAMPLES OF APPLICATION

Above 50 treatments using CarnaLife Holo.



Cooperating hospitals and centers



JAGIELLONIAN
UNIVERSITY
IN KRAKÓW



Pomorski Uniwersytet Medyczny
w Szczecinie



UNIWERSYTET
MEDYCZNY
W ŁODZI



Carint

Reference center



Europejskie
Centrum
Zdrowia
Otwock



Interventional cardiology



Interventional radiology



Cardiology



Oncology



Orthopedics



Radiology

Example of treatments

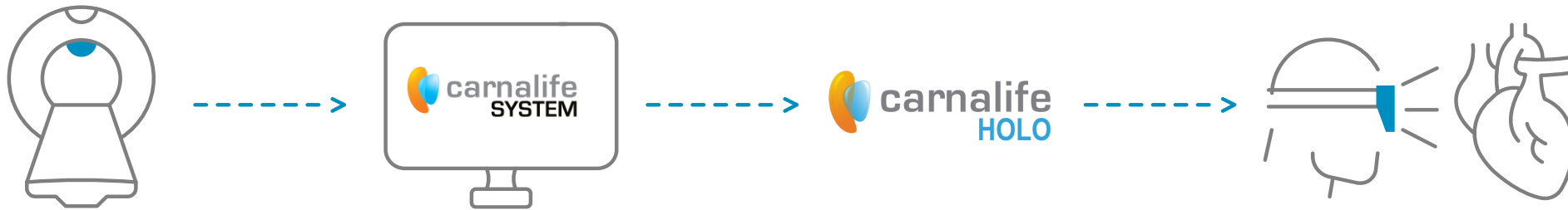
- + Ablation
- + Treatment of left atrial appendage closure
- + Treatment of transcatheter Aortic Valve Implantation
- + balloon pulmonary angioplasty
- + Atrial septal defect
 - Valvuoplasty balloon bicuspid aortic, treatment of
- + patent ductus arteriosus closure
- + Treatment of stentgraft implantation in place/to abdominal aortic aneurysm)



Video



Telemedical application CarnaLife System cooperate with CarnaLife Holo complementing its possibilities for telemedical monitoring of patients before and after treatment



Medical imaging sent to telemedical CarnaLife System platform

Displayed test in CarnaLife Holo, and HoloLens goggles

Advantages for daily practice

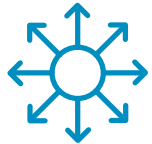


- + Patient's education for accidents and approximation to him essence of treatment
- + Potentially accelerated treatment planning and possibility of reduction amount of medical mistakes due to increased depth perception close to the natural
- + Accelerated diagnosis based on 3D images(average 6 times faster diagnosis e.g. tumors, which resulting in optimization of specialists time) [1]
- + Potentially reduction of time and more precision of performing the treatment due to bigger availability of imaging information for operators
- + Easy interaction with data based on voice commands and gestures, visualization may take natural sizes of patient, You can skip that or look inside at any angle

[1] Pelanis, Egidijus, et al. "Use of mixed reality for improved spatial understanding of liver anatomy." *Minimally Invasive Therapy & Allied Technologies* (2019): 1-7.

Cut: SMART
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Why CarnaLife Holo change medicine?



APPROPRIATE FOR MANY MEDICAL SPECIALIZATIONS

May be used by different teams in the one's hospital area



SOLUTION WHICH HELP EVEN IN PATIENTS AND STUDENTS EDUCATION

Is used in preparation of patients for the treatment, is used for better preparation for students to the future job



POSSIBILITY FOR COOPERATING WITH GE E95 ENABLING ECHOCARDIOGRAPHIC DATA DISPLAY IN REAL TIME

Chance for decreasing of potential post-treatment complications , it makes cardiologist work easier



3D HOLOGRAPHIC IMAGE, INSTEAD OF 2D DISPLAYED ON SCREEN

Faster implementation of procedures, with higher precision, and hence of decreasing possibility of physician's mistake

med app

Business Model



CarnaLife Holo



Workstation product licensing – license revenue



Seamless integration with local systems of hospitals



Preparation of a 3D modeling based on the imaging data



Maintenance & upgrade

CarnaLife System



Users license packages (medical staff: clinicians, nurses, medical administrators, etc.)



Performance based pricing (e.g. split in savings generated for payers)



Margins on payments for patients referred to partner medical centres



Maintenance & upgrade

Mode: LOCATE

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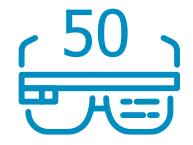
SUMMARY



Cooperation with Microsoft and GE Healthcare



CE certification (Class II b), NATO certification



Above 50 carried out medical procedures



Possibility of interaction CarnaLife Holo with CarnaLife System

Thank You

Cut: SMART
Mode: LOCATE

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