//NRGSYS

energizing software

A PERFECT BLEND OF CUSTOMER SUCCESS, WORLD INNOVATION, SIMPLICITY

WWW.NRGSYS.IT

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Sept 2020

WHO WE ARE?

NRGSYS s.p.a. IS AN ITALIAN SOFTWAREHOUSE SPECIALIZED IN **MEDICAL SOFTWARE**, **RESEARCH** AND **IT**

We create **custom software and projects** (desktop, web application and platform, mobile, hardware, firmware, system integration, cloud etc.), we provide **technical consultancy, engineering and business analysis services** for companies, corporate and startups.

We are **ISO-13485 certified** under EU MDR 2020, and we are an **Innovative SME** with trademarks and industrial patents.

We are a **real IT partner** for companies and startups of all types and sizes for the design and implementation of highly innovative systems.

Our company is an *atelier* of **tailor-made software products** built to adapt to the customer's needs, still we can scale every technical solution to meet our customers' business goal.

OUR CLIENTS

NRG OFFERS QUALITY DESIGN, RAPID PROTOTYPING, RELIABLE DELIVERY TIME AND EVOLUTIONARY MAINTENANCE FOR EACH PRODUCT

Since 2003 we have created **over 40 projects, products and prototypes**.

We are **specialized in medical and healthcare projects**, this is our core business and our expertise, but we also work on other application fields. Our customers are industrial companies, highly innovative startups, universities, and research centers, health institutes and professionals. Our IT consultancy services deliver process and product innovations, focusing on the creation of intangible assets, on the acquisition of new market shares, on increasing corporate profit.

We have around **700 software installations** (systems and licenses) in **24 countries worldwide**.
Many of the installations are currently in use at prestigious research centers and universities and for industrial, pharmacological, and medical research.

OUR SERVICES

WITH THE RIGHT COMBINATION OF TECHNOLOGY, INNOVATION AND DESIGN, NRG CAN SUCCESSFULLY SOLVE THE MOST DIFFICULT BUSINESS CHALLENGES AND PROVIDE CUSTOM SOFTWARE SOLUTIONS

CUSTOM SYSTEM DESIGN

90%

We create software and systems perfectly modeled on the customer's needs for different application fields with an eye to the quality of the user experience and maintainability.

IT RESEARCH & DEVELOPMENT

85%

Our expertise ranges in a wide variety of technologies, such as AR/VR, sensors and biosensors, micro and nanoelectronics, AI and neural networks, firmware, and much more. We are DICOM and medical imaging expert. Each new project is an opportunity to acquire new skills.

BUSINESS ANALYSIS & DESIGN

90%

Our analysts are able to provide detailed and highly qualified reports of the customer's technical needs and to propose, accordingly, calibrated developments in line with business needs.

SYSTEM INTEGRATION

80%

The integration of hw and sw components has become over time one of the flagships of our services. We manage to make complex systems communicate in flexible and performant management interfaces.
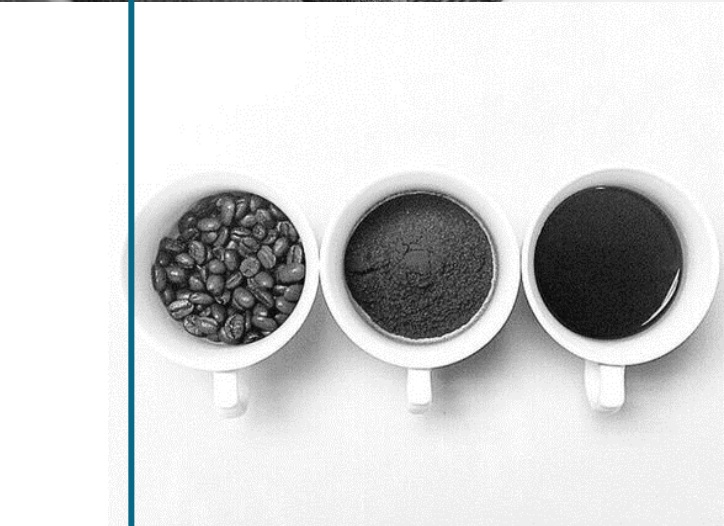
OUR PEOPLE

AT THE CORE OF NRG IS OUR TEAM OF PASSIONATE AND EXPERT DEVELOPERS, ANALYSTS, AND DESIGNERS

NICO CIAMBRONE
founder

Formerly IT engineer and manager in a multinational company. Technology dreamer and innovation inspirer, capable of capturing and interpreting market and competition insights, trends and predictions

MARCO CIAMBRONE
CTO

Senior software developer, architect, business analyst, team leader, and agile project manager with 15 years of experience in successfully delivering software medical devices to worldwide customers

SASO KOCESKI
head of R&D

Full professor in Advanced robotics and intelligent system, Artificial Intelligence, Computer Vision, Human-Machine integration, Microprocessor and Microcontrollers

We provide high quality and insightful expertise focused on the best strategy for achieving our client's objectives. We also have **a pool of top-level outsourcing consultants** for: 3D modeling, 3D printing, microelectronics, firmware etc ...

EXPERTS IN MEDICAL

NRG CAN PROVIDE EXCEPTIONAL SERVICES AND PRODUCTS FOR THE MED-TECH FIELD

We mastered **3D rendering** and **image processing**: we extract three-dimensional models of organs, cells and other anatomical structures from medical images (like CT, MRI, PET, DEXA); we have great experience in **segmentation methods**, **artificial intelligence** and **deep learning.**

Over time we built powerful software for many purposes, such as:
- Control systems for radiological imaging equipment;
- Control systems for MRI equipment in the field of pre-clinical, pharmacological and clinical, for human and vet;
- Guidance for oncological, in both planning and execution through augmented reality devices;
- Planning for endovascular aortic implants;
- Dental implant planning and bone grafting;
- Pre/post-processing and management for radiological images.

We applied our creativity also in unconventional and innovative uses such as **gaming applied to medicine**.
We worked on **wearable devices** for monitoring biological parameters and with different kind of **sensors** and **biosensors.** We work with sophisticated hardware, such as 3D printers, AR/VR devices and different types of robots. Our experience embraces **IoT applications** with the integration of highly sophisticated sensors and big data back-end, enhancing our systems with AI solutions.

OUR SKILLS

NRG DESIGNS AND DELIVERS SUCCESSFUL PROJECTS FOR MEDICAL, INDUSTRIAL, WEARABLE, ROBOTIC, RESEARCH, AND MANY MORE FIELDS

We believe in great products and **always focus on innovation** by implementing **cutting-edge technologies**, still keeping the **best ease-of-use.**

We work alongside our customers as a **technological partner**, innovating together, step by step, to update existing products and create new high-tech solutions.

Together with the customer, we identify the technological mix that best suits the specific business needs, strategy, long term objectives, regulations, and time to market. With the right combination of technology, innovation, and design, we can successfully solve the most demanding business challenges.

**You didn't find what you need?
Still don't know what you need?
CONTACT US!**

UX DESIGN

DESKTOP APPS

PUBLIC & PRIVATE CLOUD SYSTEMS

MOBILE APPS

AR / VR

AI: MACHINE / DEEP LEARNING

BACK-END SERVICES

SENSORS & BIOSENSORS

SYSTEMS AND APPLICATIONS INTEGRATION

IOT & WEARABLE

WEB FRONT-ENDS

CERTIFICATIONS & PATENTS COMPLIANCE

FULLY CUSTOMIZED SOLUTIONS

OUR WORKS

NRG HAVE A STRONG INCLINATION TOWARD INNOVATION AND EXPERIMENTATION WITH NEW TECHNOLOGIES FOR UNCONVENTIONAL USES, FIND HIDDEN AND UNEXPECTED POSSIBILITIES OFTEN BEHIND METHODS TAKEN FOR GRANTED

Over the years, we had the privilege of working on many innovative and stimulating MedTech research projects, many of which conducted abroad. We worked on projects of different medical domains and various electro-medical devices (i.e., CT, MRI, PET, DEXA) using different technologies.

The experience and expertise have gained by developing products in the field of medical research, and the specific customer segment to which these products are intended have allowed to stand out over time: performing interfaces, with innovative user experiences, tailored for the customer, with reliable architectures and original technological solutions.

A portfolio of the company's main products follow, divided by macro categories.
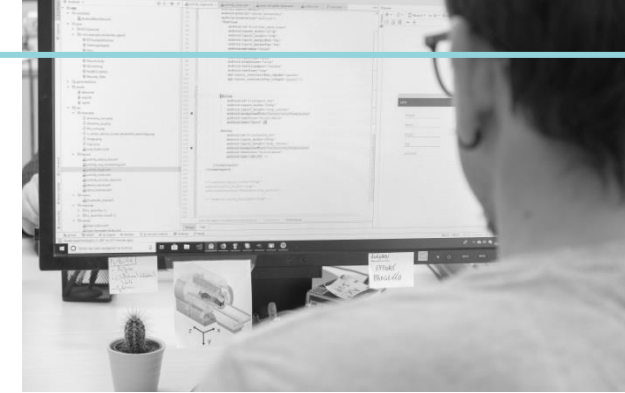
RADIOLOGY EQUIPMENT CONSOLE
- dVISION
- OTMRI (One touch MRI)
- NRG Console

PRESURGICAL PLANNING
- NerveVision I
- NerveVision II
- OS3D
- ENDOSIGHT
- SRM (Surgery Risk Management)

ROBOTIC/IoT/WEARABLE
- HIMAERO
- ST.AR.

MISCELLANEUS
- ODAS (Ophthalmic Data Analysis System)
- EVARPLANNING
- SMART LAB

R&D PROJECTS
- CAPTURE
- PRINTMED-3D

BONE DENSITOMETRY EQUIPMENT CONTROL AND IMAGE PROCESSING

AN INNOVATIVE MANAGEMENT CONSOLE FOR A NOVEL DEXA MACHINE WITH INNOVATIVE USER INTERFACE

System composed by a DEXA device controller, a software for scan acquisition, a patient database and a set of image measuring and reporting tools.
Simplified operation and workflow in an extremely user friendly environment with top quality signal analysis
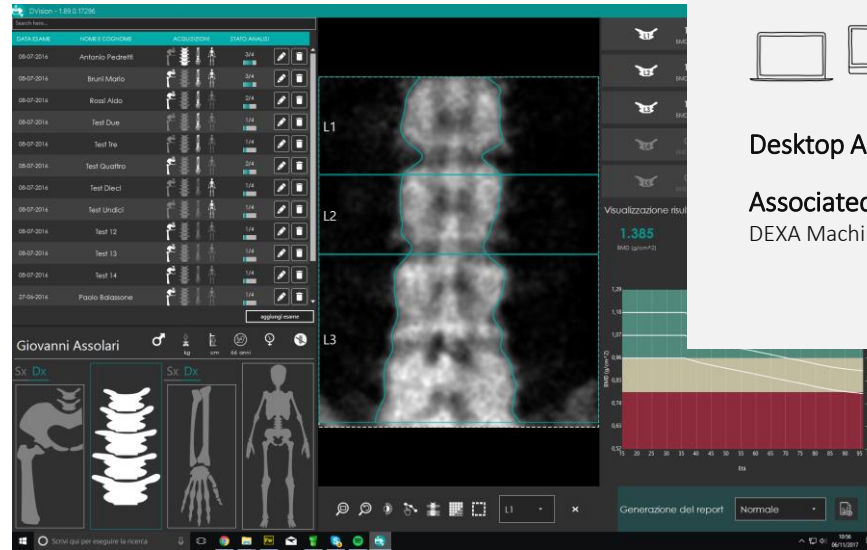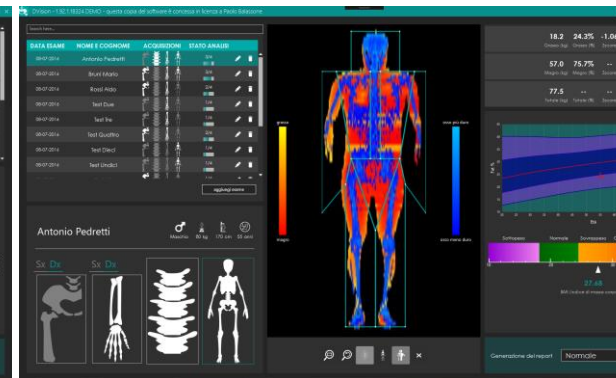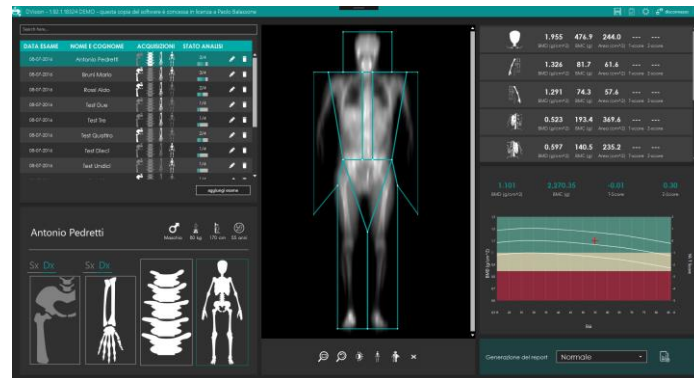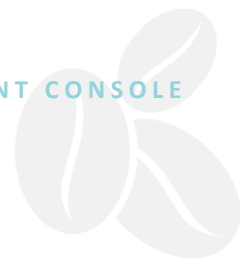
Desktop Application | 2019

Associated HW
DEXA Machine
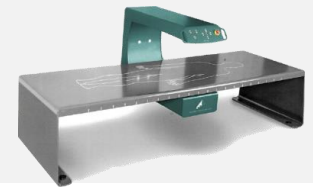
Partner
Eurotec Medical System (Italy)

Tags
#bone densitometry #osteoporosys #osteopenia #BMD #body fat analysis

9

MRI EQUIPMENTS CONTROL AND ADVANCED POSTPROCESSING IN PRE-CLINICAL

A REVOLUTIONARY APPROACH IN THE WORLD OF MAGNETIC RESONANCE FOR RESEARCH, A MULTI-DEVICE SYSTEM AND A COLLABORATIVE PLATFORM IN THE CLOUD FOR SHARING DATA AND EXPERIENCES

The OTMRI (One Touch MRI) console has been designed to work in a preclinical research environment and to allow even non-expert users to launch sequences and perform exams and acquisitions in the simplest and fastest way possible thanks to an innovative user experience.

Client
Aspect Imaging (Israel)

Tags
#MRI equipment control

#img acquisition/manipulation

#full DICOM protocol integration

Multidevice Application | 2016

Associated HW
MRI for pre-clinical
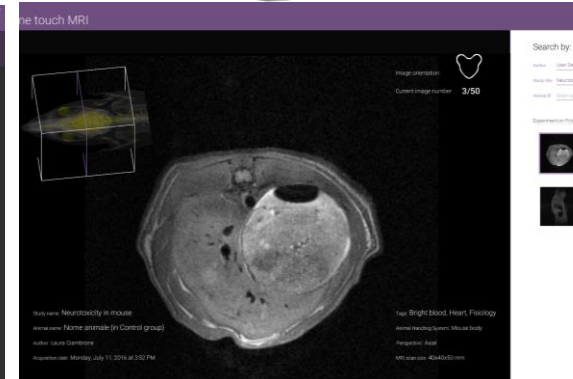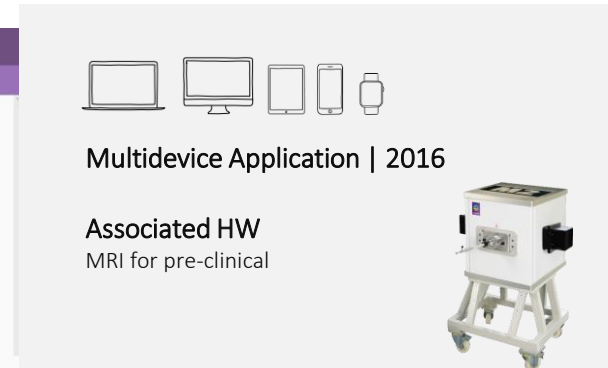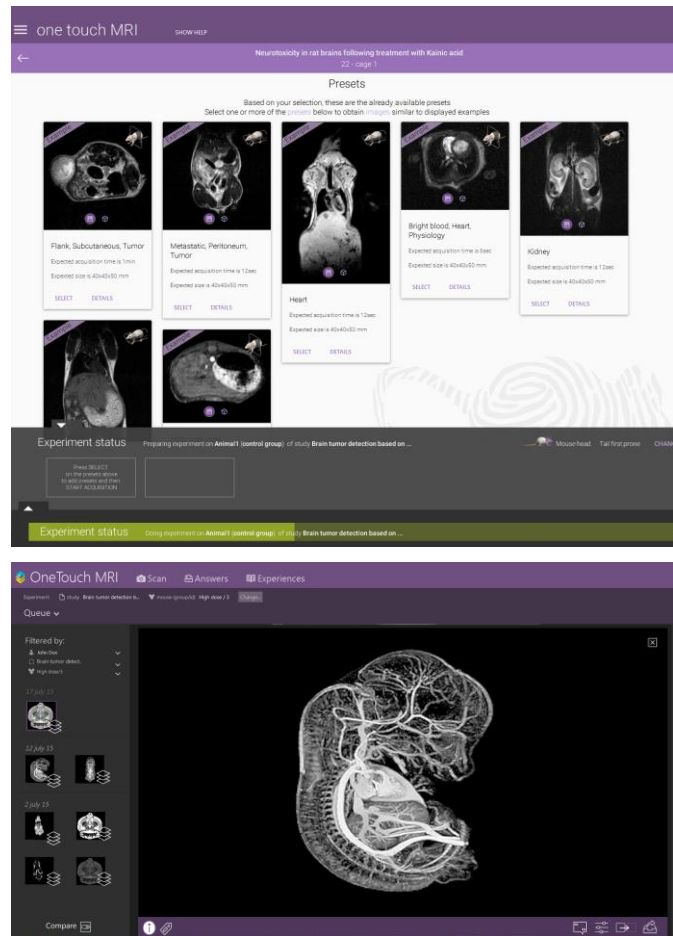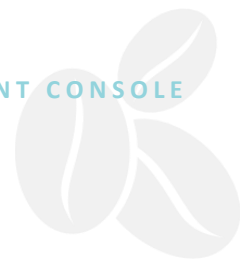
MANAGEMENT CONSOLE FOR MRI

NRGCONSOLE IS THE SIMPLEST AND ADVANCED TOOL FOR DESIGNING, TESTING AND DRIVING ANY TYPE OF SPECTROMETER IN ORDER TO ACQUIRE MRI IMAGES

Management console control for MRI;
about 300 installations worldwide.

MRI subsystem equipment of a multi-mode PET / SPECT + MRI;
about 20 installations in the world.

Client
Paramed (Italy) for clinical
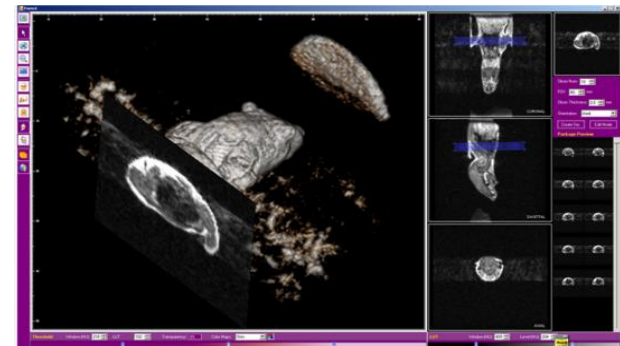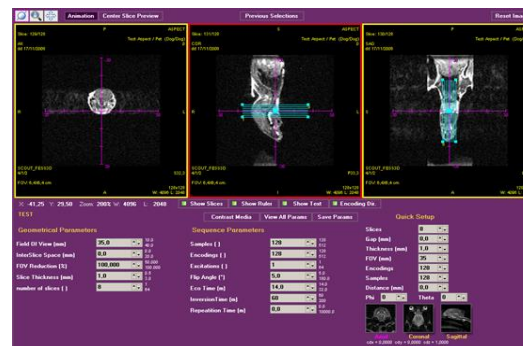Aspect Imaging (Israel), Mediso (Hungary)
for preclinical

Tags
#easy to use and to learn #simple and stable #fast sequence development
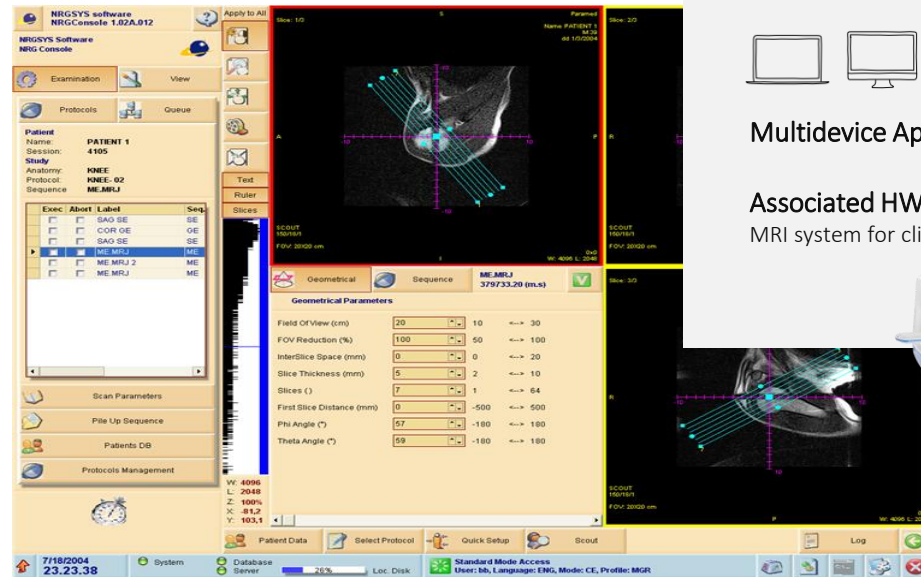
Multidevice Application | 2004-2009

Associated HW
MRI system for clinical and pre-clinical

POST-PROCESSING TOOL FOR NEURORADIOLOGY SPECIFIC FOR PERIPHERAL NERVES

CARPAL TUNEL DIAGNOSYS AND MEDIAN NERVE SEGMENTATION WITH AUTOMATIC ANALYSIS OF THE SUFFERING SECTION

It provides a fully scalable 3D reconstruction of the median nerve, allowing the full visualization of the integrity of the myelin sheath, with rotation, and color enhancement, without the use of contrast agents.
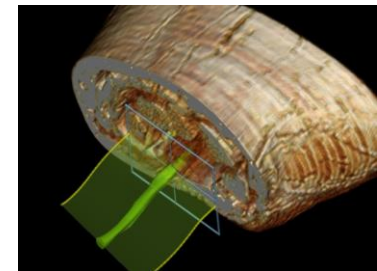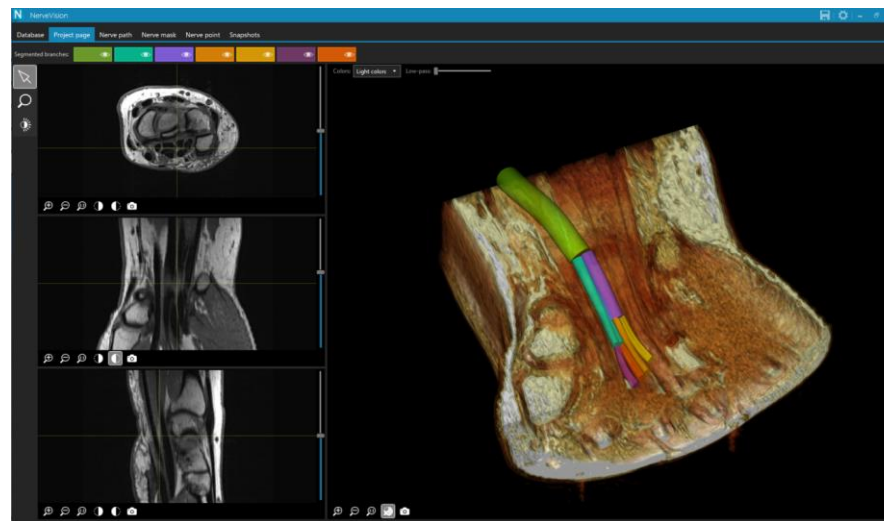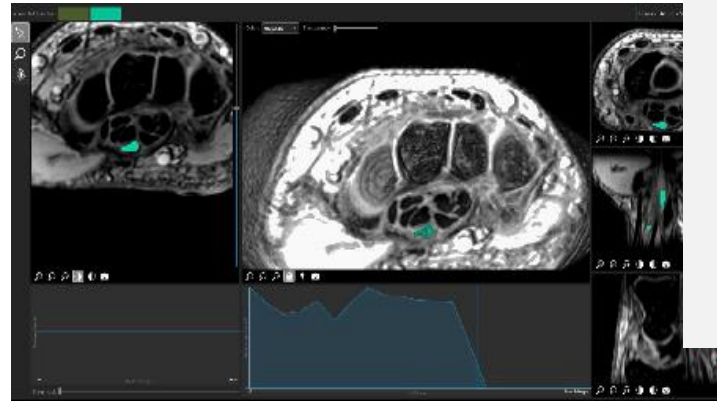
4 test installation at: John Hopkins (Baltimora), Mass University (Boston), Washington State Universiy (Seattle), South Western University (Dallas)

Desktop Application | 2015

Associated HW

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Client
3D IP (Canada)

Tags

#neuro-radiology #carpal tunnel #periferal nerves #inflammation detection

PRE-SURGICAL SPINAL PLANNING WITH AUTOMATIC NERVE SEGMENTATION SOFTWARE

USE THE COMBINATION OF CT AND MRI SCANS TO VISUALIZE ALSO THE NERVES, USUALLY INVISIBLE IN THE CT SCANS, WITHIN A 3D ANATOMICAL RECONSTRUCTION OF THE PATIENT'S BACK

Software designed to be used in combination with advanced in-surgery equipment/methodology.

Study and/or pre-market collaboration with TrueVision (USA), Synaptive (Canada), 7D Surgical (Canada).
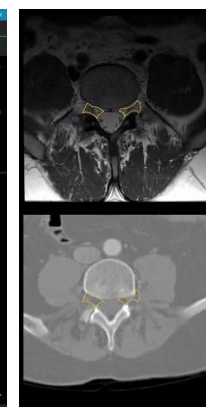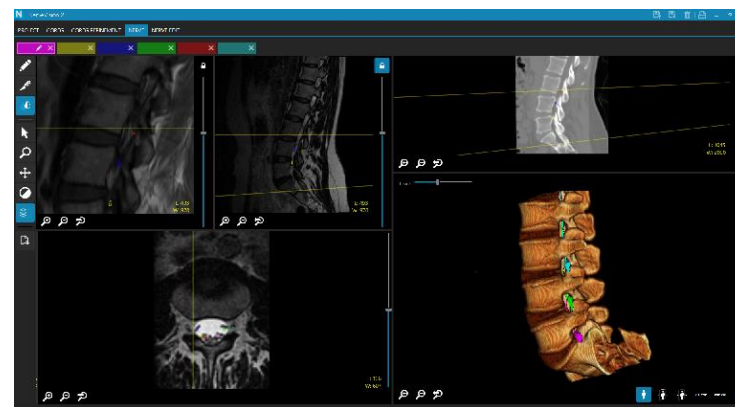
Client
3D IP (Canada)

Tags

#neuro-radiology #spinal nerves #presurgical planning #inflammation detection
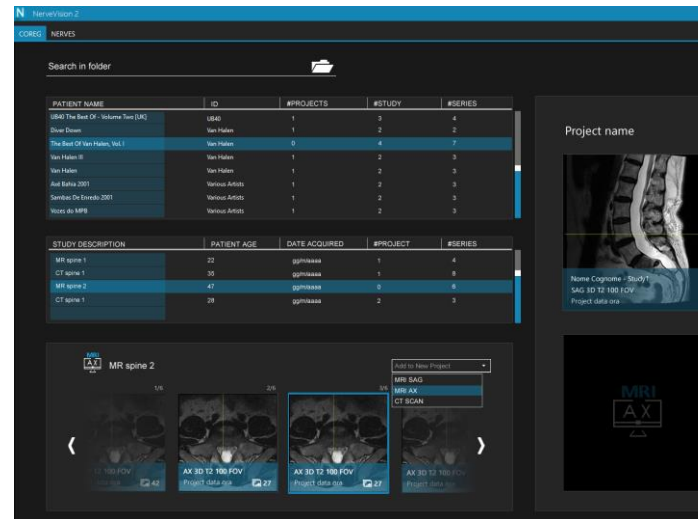
Desktop Application | 2018

Associated HW
Stereoscopic microscope
Immersive 3D display
Navigation system

# DENTAL IMPLANT PLANNING AND GUIDED SURGERY SOFTWARE

**ALLOWS EXTREMELY SECURE, EASY AND CHEAP TRANSFER OF THE VIRTUAL PLANNING ON A SURGERY GUIDE.
COMPATIBILITY WITH ALL BRANDS.**

Hight level of security in surgery and prosthetics.
The high image definition, facilitates the observation of the anatomical structures, allowing proper and secure planning and reducing all uncertainties during surgery.
Automatic detection of collisions between implants and collision between implants and nerve
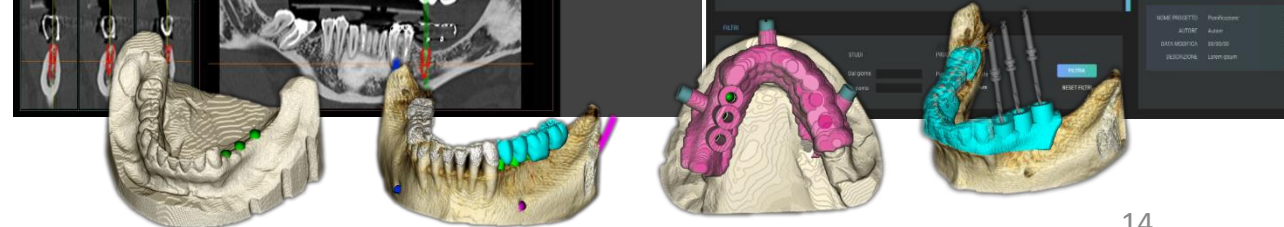
Client
Maja (Italy)

Tags
#dental #implant planning #oral surgery
#bone grafting #guided surgery
#computer aided surgery
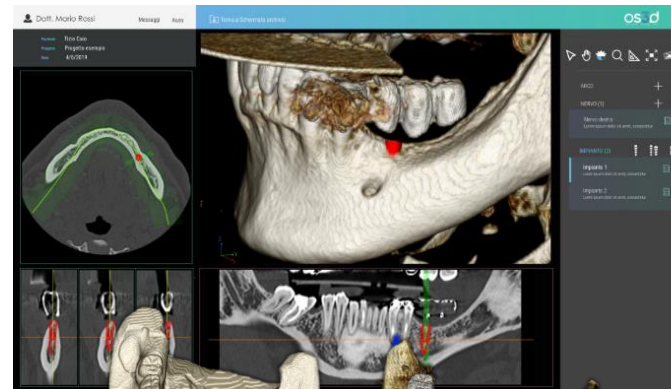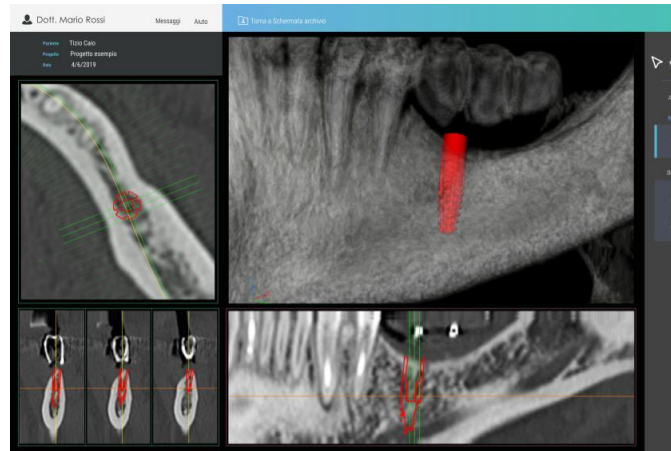
Desktop Application | 2019

Associated HW
Intraoral scanner (laser scanner)
3D printer for dental

ELECTRO-MEDICAL EQUIPMENT FOR NEPHROLOGICAL ENDOSCOPIC SURGERY SOFTWARE

SURGICAL GUIDANCE SYSTEM IN AUGMENTED REALITY FOR CT BASED ON THERMO-ABLATION AND VIRTUAL REALITY VIEWER

Able to show to surgeons performing minimally invasive oncological interventions the organs and diseases with very high precision, facilitating the navigation of the operating instruments to the target. Is able to convert medical images into data, extracting important information on the biological characteristics of cancer through the analysis of biological history database.
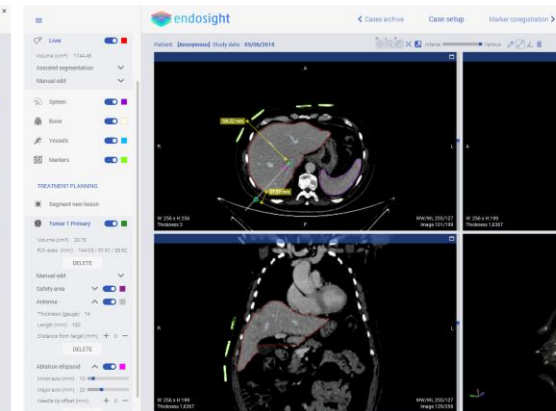
Client
R.A.W. (Italy)

Tags
#MedicalImaging #CT #Segmentation #ElasticCoregistration #DICOM #AR #VR #MixedReality #SoftwareIntegration)
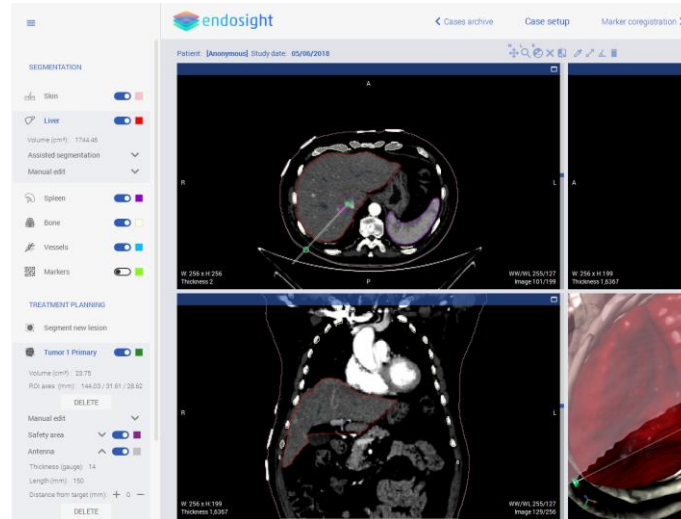
Multidevice Application | 2019

Associated HW
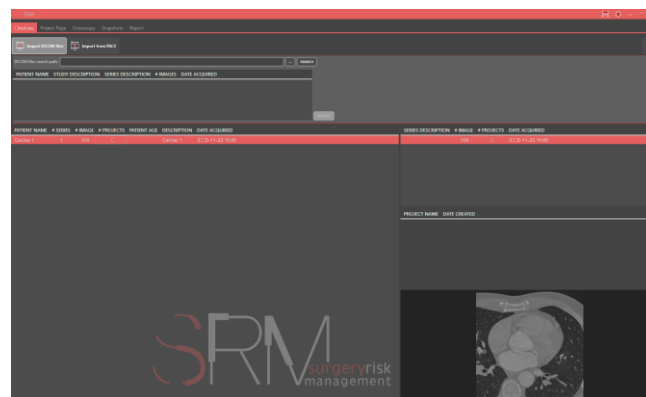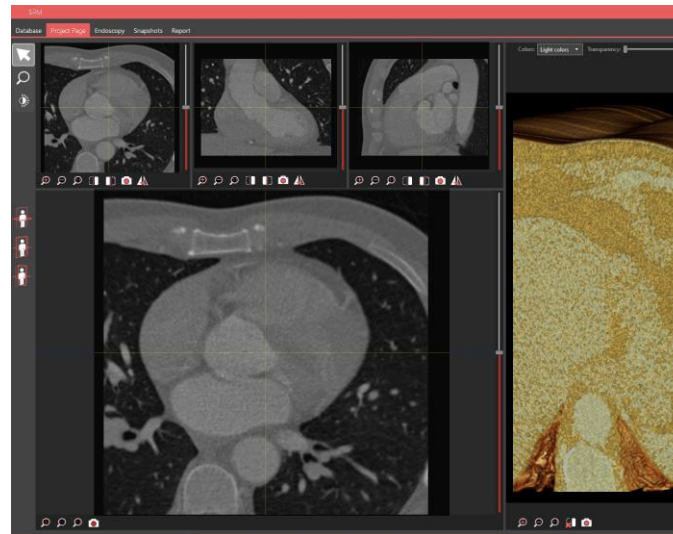Surgical HW (Patent pending)
Oculus Rift (for VR)

MINIMALLY INVASIVE THORACIC SURGERY SOFTWARE

2D AND 3D VISUALIZATION TOOL FOR QUANTIFICATION AND SEGMENTATION OF IF, IHC AND GEL IMAGES

The SRM application uses CT data to reconstruct the patient's anatomy and to identify the best access point, customized to the patient's specific anatomy, to allow the insertion of minimally invasive surgery instruments in the surgery phase.
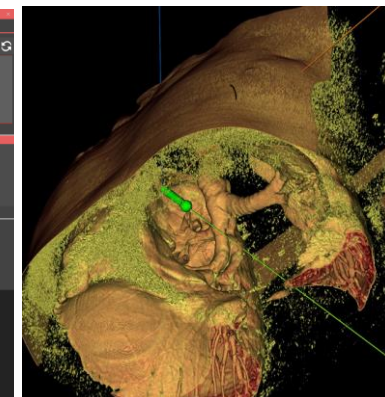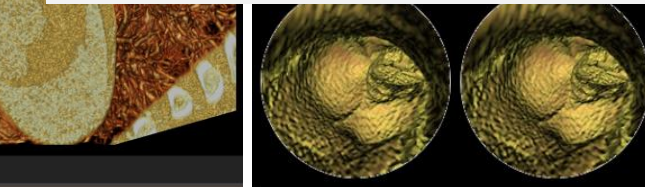

Desktop App | 2016

Associated HW
Surgical HW
Oculus Rift (for VR)

Partner
HR&S (Italy)

Tags
#VR surgical training #mininvasive surgery
#3D recistruction navigation

16

HIMAERO: THE EMOTIONAL JEWEL

HIMAERO REINTERPRETS THE CONCEPT OF THE WEARABLE TECHNOLOGY, ADAPTING ITS COLORS TO THE MOOD OF THE USER OR ACCORDING TO THE LOOK, IN ORDER TO FIT EACH OCCASION

The jewel enclosing a technology able to change its color according to multiple factors. It elaborates the data collected from the sensors and the smartphone and personalize the color according to the mood; thanks to its artificial intelligence, over time it will provide ever more accurate results.
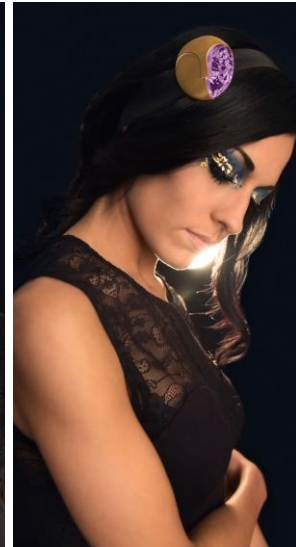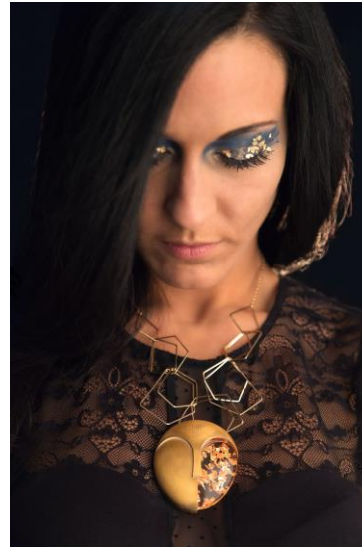
This project won the **WORTH Partnership Program** in Madrid.

Client
HIMAERO (Italy)

Tags
#wearable device #sensors #mood #emotion #jewel

Mobile App | 2018

Associated HW
The HIMAERO jewel
(microelectronic and sensors)

WORTH
PARTNERSHIP
PROJECT

MONITORING ROBOT FOR CLINICAL REMOTE DIAGNOSYS & ASSISTANCE

EXPERIMENTAL RESEARCH PROJECT USING MILITARY-DERIVED BIOSENSORS. MADE DURING THE EBOLA EMERGENCY

Designed to operate in environments with a high chemical or biological risk, remotely controlled, it is able to apply a block containing sensors capable of measuring ECG, heart rate, respiration rate, temperature and humidity and sending them to a control system.

This project was presented to the **EXPO 2015** in Milan.

Partner
Capitank (Italy)

Tags

#remote clinical diagnosis #dangerous biochemical #healthcare #biosensors

Robot + Mobile App | 2015

Associated HW
The Robot
The sensor block (Manta)

# OPHTHALMIC SURGERY TECHNICAL CLOUD

THE SYSTEM COLLECT THE DIAGNOSTIC INSTRUMENTATION MEASUREMENTS AND USE THE AI TO OBTAIN A REAL-TIME DASHBOARDS AND ALL INFORMATION TO SUPPORT THE INTERVENTIONS

An EMR (Electronic Medical Record) cloud-based system for patients in eye clinics; the system solves the complexity of the integration of data from many measurement systems that are generally closed, maintaining very heterogeneous data without a reference standard.
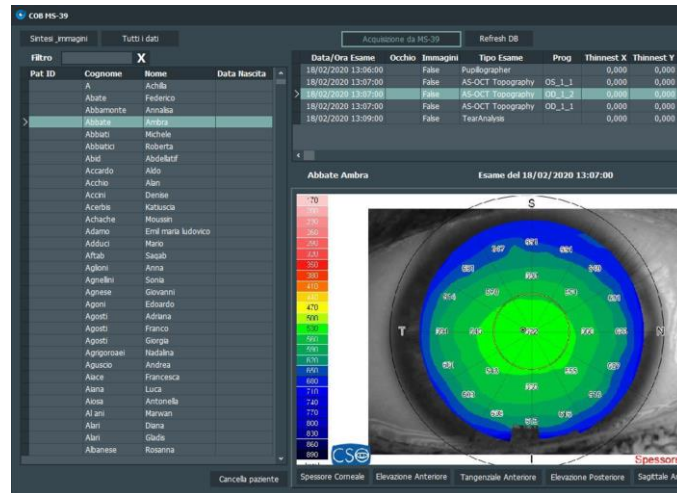
Desktop / Cloud App| 2020

Associated HW
Ophthalmic diagnostic equipment
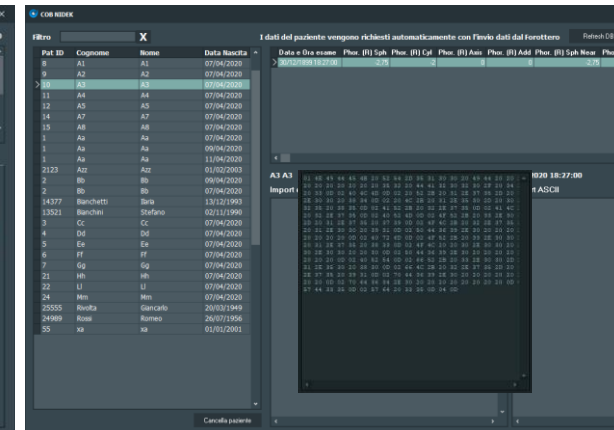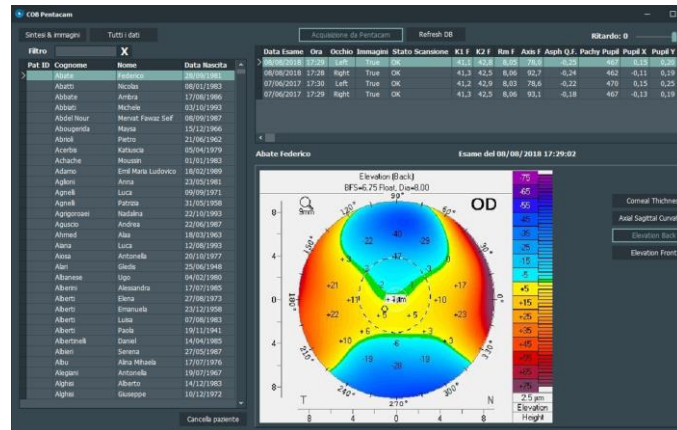
Client
Centro Oculistico Bresciano (Italy)

Tags

#patient dashboard #DSS (Decision Support System) #data system integration

#cloud computing #AI

19

CLOUD COLLABORATION PLATFORM FOR CLINICAL DATA EXCHANGE AND INTEGRATION OF AN EXISTING WEB-APP

THE PLATFORM BRINGS TOGETHER DIFFERENT TYPES OF ACTORS IN THE PLANNING AND ORDERING PROCESS OF CARDIOVASCULAR PROSTHESES FOR AORTIC SURGERY

The platform allows cardiovascular surgeons to identify and order the most suitable arterial implants for each patient from manufacturers.

The platform improves the interaction between doctors and product specialists, in full compliance with the GDPR regulation (because of the manipulation of patients' clinical personal data).

Client
R.A.W. (Italy)

Tags
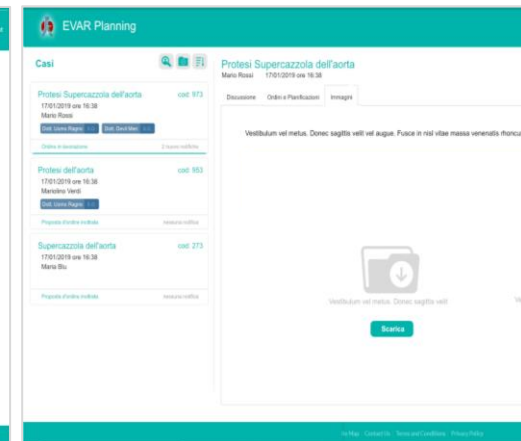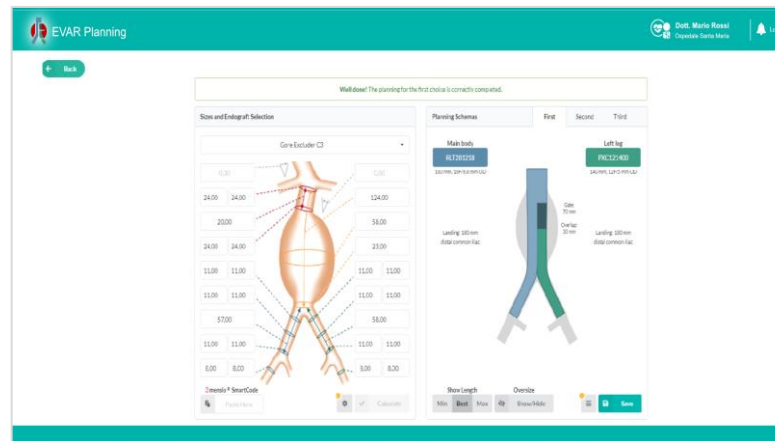#cloud collaboration platform #HIPAA compliant #ciber security #medical data exchange
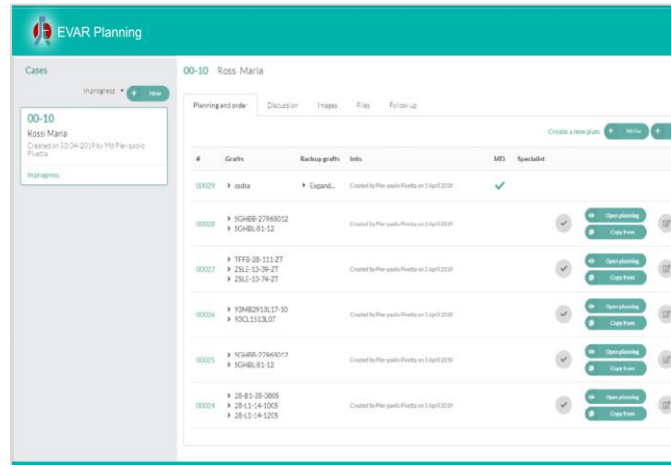
Cloud App| 2019

Associated HW

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ALGORITHM FOR MOLECULAR IMAGE ANALYSIS WITH CELL MEMBRANE SEGMENTATION

2D AND 3D VISUALIZATION TOOL FOR AUTOMATION OF QUANTITATIVE AND QUALITATIVE ANALYSIS ON IHC SAMPLES/IF IMAGES.

The software emulates human-made analysis using specialized algorithms (eg segmentation, edge detection) and to reproducibly and quantitatively quantify the expression of the target and the binding of antibodies to the target through laboratory test digitization procedures. Allow to analyze also images deriving from multichannel acquisitions, performing multiplex evaluations of a high number of proteins per sample.

Client

Oncoxx Biotech (Italy)

Tags

#reduce operator variability #improve data acquisition #immunohistochemistry #immunofluorescence
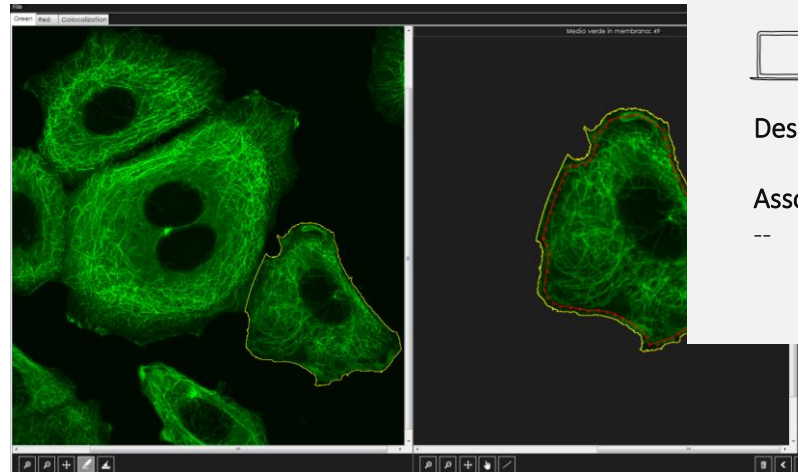
Desktop App | 2016

Associated HW

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R&D PROJECT 2019-2021

NON-INVASIVE SOLUTION FOR CORONARY ATHEROSCLEROTIC PLAQUE RUPTURE PREDICTION

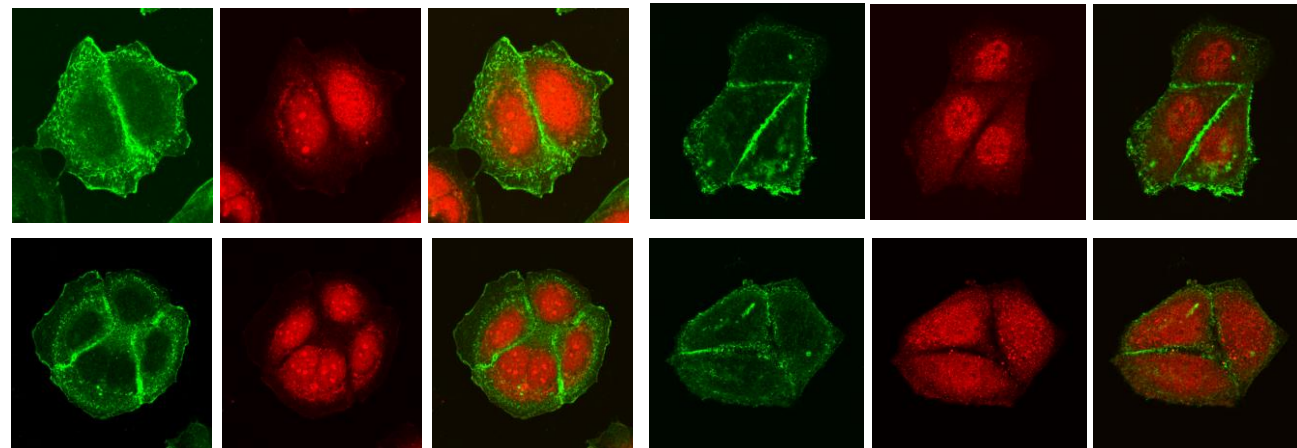CAPTURE is a software solution for the non-invasive assessment of coronary atherosclerotic plaque vulnerability for ischemic heart disease, based on the integration of tools fed by heterogeneous clinical indicators and the use of different analysis methods.

CAPTURE will:
- offer a software platform where heterogeneous, patient-specific clinical information is fused into a single indicator of presence of a high-risk plaque in patients with suspected coronary artery disease
- provide a smooth and efficient data processing workflow where patient-specific information is analysed by combining different methodologies (image segmentation, plaque geometry quantification, advanced visualization and rendering, radiomics, biomechanical structural analysis)
- use artificial intelligence models to identify multiple biomarkers of plaque disruption and to assess the presence of a high-risk plaque
- present the analysis results in a concise, easily understandable and self-explained graphic format.

Partner
ASST Pavia (Italy), Politecnico di Milano (Italy)

Research and development goals

Utilization of a combination of different data (images, blood parameters, demographics) and technologies (anatomic segmentation, radiomic analysis, finite elements analysis) interpreted through Artificial Intelligence in order to calculate a unique coronary plaque rupture risk factor.

Sistema Socio Sanitario
Regione Lombardia
ASST Pavia

POLITECNICO DI MILANO

R&D PROJECT 2020-2022

PRINTMED-3D AIMS TO CREATE AN INFRASTRUCTURE FOR THE DEVELOPMENT OF ENABLING SOLUTIONS FOR PERSONALIZED MEDICINE AND SPECIALIST TRAINING THROUGH THE COMBINED USE OF VIRTUAL REALITY TECHNOLOGIES AND FUNCTIONAL 3D PRINTING

The creation of **virtual models equipped with a functional physical consideration** obtained through the integration of additive printing of innovative materials with intelligent fluidic systems will enable the programming and planning of the surgical interventions phases, improving the effectiveness of the treatments, reducing the risks for the patient and reducing the operating and post-operative timing.

The results will be shared in the cloud which can be accessed by Schools of Medicine and Hospital Departments providing access to students and doctors specializing and / or already trained to view patient-specific anatomy and to simulate complex surgical procedures and to carry out advanced health assessments.

The development of innovative techniques and materials for 3D printing will also be used for the prototyping of highly efficient and reproducible automated fluidic platforms for dynamic cell culture, in view of applications in cell factories.

Partner
Regione Lombardia (Italy), Università di Milano Statale (Italy), Fondazione IRCCS Istituto Neurologico Besta (Italy), Kentstrapper (Italy), Dolphin Fluidics (Italy), Intra (Italy)

Research and development goals

Creation of an infrastructure for developing, organizing and managing technologies based on the processing of medical images and declining them for the production of innovative virtual reality solutions coupled with 3D printing of functional and dynamic anatomical systems for clinical, educational and diagnostic purposes.

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