14 NOVEMBER 2017 EUROPEAN HOSPITAL MEDICAL, TECHNICAL, PHARMACEUTICAL, INDUSTRIAL NEWS

DUSSELDORF • TUESDAY • 14 NOVEMBER 2017

Artificial intelligence (AI) will take centre stage during the Medica Academy sessions. While talks will focus on initiatives made in Germany, European Hospital took a look at Spain and spoke with Ignacio Hernández Medrano, a neurologist recently elected as one of the most influential people in healthcare (HC). At just 34 years old, Medrano has already founded two flagship AI projects, one of which enables extraction of valuable data from clinical reports written in free speech: Savana. With a name that echoes fertile lands, the solution may prove very helpful when it comes to mining valuable clinical information.



Interview: Mélisande Rouger

What is Savana?

'As doctors, we have been gathering information from our patients' clinical records for many years. This information has great value, but until now it hasn't really been exploited, because we write our reports in natural language, or free speech. We write in complex semantics and narratives, rather than in a structured way. 'For some years we have been using natural language and linguistics computational processing, so that computers can decode human language. That's the technology used by Google, for instance.

'Savana is the first company that has been able to subspecialise this Al technology to convert free speech contained in clinical records in a database, and to mine this data.'

What inspired this business idea initially?

'In our society, we have access to large databases all the time, whether for music, banking, etc. In healthcare, very large quantities of data are being generated, most of which are digital, however, we did not reuse it – which is possible with technology and a bit of organisation. So that's what we did.' now and use big data in healthcare. Just as e-banking is becoming banking, e-health is becoming health. The Spanish healthcare system is very strong, but things may change within 10 years if we don't realise that health is becoming digital.'

Are doctors or healthcare people resisting this?

'Innovation means realising that you need to get it wrong three or four times before it works. This is very hard to accept in healthcare. Mistakes are badly tolerated, so it's harder for innovation to go further in this sector. That's why big data and digitisation have advanced in other areas, such as banking.

'Nevertheless, no human production generates as much data as a hospital. So big data has an important role to play in healthcare too; and it already does, at the level of drugs and diagnostic or therapeutic algorithms, which improve human capacities.

'It's true that doctors tend to have a conservative attitude, especially regarding their role in society. But, when one realises that powerful algorithms that can improve diagnosis and treatment can be obtained through managing large amounts of data, then everything will fall into place, because patient care improves. If a machine gives what's best to the patient, doctors will follow. And that's not the future: that's right

Savana goes data mining Veurologist Ignacio Hernández Me y Cajal Hospital in Madrid, Spain, ve

States and Argentina, and we hope we will expand soon.'

Are you working on other projects? 'Yes, I'm working with Mendelian, a company in the United Kingdom, which has developed an online rare disease search engine, built with the aim of increasing diagnostic hit rates. I met the other people behind Mendelian while studying at the Singularity University.

'Rare diseases are complex and take a long time to be diagnosed. There's very little knowledge around these diseases, and our tool offers to speed up the process. Rare diseases associated genes and their existing gene panels are algorithmically matched to phenotypes. Recently we've helped a kid with a rare disease to be diagnosed.'



Neurologist **Ignacio Hernández Medrano MD** at Ramón y Cajal Hospital in Madrid, Spain, was elected one of the most influential healthcare professionals in 2016 by the specialised press for his work in HC systemic change due to information technology and big data use. He holds several masters in HC management, and he notably sits on the strategic board of Ramón y Cajal HC Research Institute. He gained a bachelor degree at the Singularity University (NASA, Silicon Valley) in 2014 and founded two emerging companies using artificial intelligence: Savana (electronic clinical records processing) and Mendelian (rare disease diagnosis and treatment).

What did you learn at the Singularity University?

Private companies founded the university eight years ago to promote the impact of positive technology. The school has an annual number of 80 people who all want to improve living conditions by using high impact technologies and a positive, exponential approach.

'Technology is changing the lives of many people. Having an exponential approach means that we believe things will go much faster than we expect. This way of thinking changed me; the future is much closer than what we believe. The future will come and it will be for the good; there will be associated problems, of course, but it will improve people's lives.'

Link: https://savanamed.com



Latex gloves make great balloons but they make lousy probe covers.

Sure, exam gloves are always close by, but using one as a probe cover is awkward, especially with a large 3D/4D probe. They also allow for wasted ultrasound gel, make an incredible mess, and if the glove is latex, it may cause an allergic reaction in patient, clinician, or both. You, your ultrasound probe, and most importantly your patient deserve better. The Eclipse® 3D, Parker's newest probe cover, was designed solely for 3D/4D probes. Save the gloves for their intended use or for decorating the next office party.





www.metaltronica.com

- 1977 Metaltronica is founded
- 1988 Metaltronica launches its Compact Mammo - the first European made.high frequency system with a fully automated

Is Savana unique?

'There are many innovative companies in Spain; social entrepreneurship is growing steadily. Technology is a great way to improve people's lives. Savana handles very big amounts of medical information, which very few private or public projects do. We manage tens of millions of clinical episodes and this makes us very unique. '

How is big data developing in Spain?

'Unlike Germany, the UK and the US, Spain did not pave the way for big data use. We need to get on board

Currently, how many hospitals use Savana?

now.'

'We provide services to around 40 hospitals, so that would be a six million population. We definitely should have more by the end of the year. The more clinical information we have, the better it will be for everyone.

'Outside Spain, we have information from Chile, and contacts with the United Kingdom, the United

- I KODE COTE





mid '90s Metaltronica introduces its FLATE mammography system which becomes the gold standard

- 2004 Metaltronica begins to manufacture its digital system
- 2015 Metaltronica launches its tomosysthesis system
- 2017 Metaltronica under new ownership and executive guidance enters an era of innovation and overall development
- 2017 Metaltronica introduces its new Compact 2D digital system





WWW.HEALTHCARE-IN-EUROPE.COM

Cutting time spent on fiddling with screens and devices

Pixel perfect surgical displays

care', the economical organisation of operating theatres is critical. Surgical procedures also contribute as much as 60-70% of hospital revenues. Thus surgical efficiency and flexibility are paramount in surgical departments.

However, the huge amount of medical devices combined with constantly evolving imaging technologies can make changes between different

An automated failover feature guarantees a backup signal at all times to ensure safe surgery

Given the aim to provide 'affordable surgical procedures and preferences for advanced video integration, fuels time-consuming and possibly risky. the quick adoption and pixel-perfect

Healthcare imaging specialist Barco has developed a surgical solutions portfolio to enable more efficient and effective use of an operating room.

Safe image-guided surgery

Barco reports that it's 'surgical solutions work seamlessly together to provide precise images to any integrated, hybrid or interventional operating room. The wide range of surgical displays, combined with Nexxis

for advanced video integration, fuels the quick adoption and pixel-perfect representation of current and new imaging technologies. So surgical staff can concentrate on patient care instead of spending critical time on fiddling with screens and devices.

'This is quite crucial because, in image-guided surgery, the displays are the eyes of the surgeon. Barco's Full HD and 4K surgical displays provide the right depth and colour perception to offer the best visual guidance for surgeons. Every image is calibrated, rendered quickly, and displayed precisely, for perfect hand-eye coordination. In addition, a unique automated failover feature guarantees a backup signal at all times to ensure safe surgery.'

Maximum use of the operating room

'Though the quality of surgical images may be impeccable, smooth display of those images during image-guided surgery can be problematic,' Barco points out. 'In fact, it's considered one of the biggest challenges by OR staff (according

> Barco is at Medica Hall 10 / Stand F67



to a MarkeTechGroup 2016 survey), which is why Barco developed Nexxis for video integration. It's the most flexible, scalable and reliable solution for managing images and video during surgical procedures.

'Thanks to its intuitive plug and play approach (just plug the source into the system, and Nexxis will display it anywhere inside or outside the operating room), Nexxis enables faster turnarounds in the operating

The plug and play approach enables faster turnarounds in the operating room

room and increases uptime. Because of the high flexibility of the system, you can keep pace with emerging technologies, so the OR is 100% future-proof.

'In a time when healthcare efficiency is under scrutiny, it's exactly these kind of solutions that will help healthcare professionals do more and perform better, with less.'

Barco's complete line of surgical solutions is on show at this year's fair in Dusseldorf.

Top quality single-use suctions

A pioneering single-use Diathermy Abbey Needle with suction that helps surgeons improve performance and outcomes during a range of procedures is on show at this year's Medica. Developed by Single Use Surgical, the firm reports that the device improves visibility at the surgical site during submucosal diathermy (SMD), turbinectomy and breast surgery. 'It offers a unique combination of precise cauterisation and targeted suction helping to remove surgical smoke and reduce the risks associated with reprocessing a reusable

A pioneering single-use Diathermy monopolar device,' the firm explains.

Single Use Surgical was established in 2001 as a direct response to UK hospitals' concerns over the cleaning practices involving fine lumen instruments, and how it posed a high risk of cross contamination between patients, the company points out. 'Since then, we have developed the widest range of high quality and specialist single-use suctions capturing the same look, feel and functionality as the reusable equivalent.'

The manufacturer makes products with stainless steel tubes rather



than aluminium, which, it reports, has helped it to become a leading single-use medical device specialist. The range spans many specialties

Single Use Surgical is at Medica Hall 16 / Stand F42

Homogeneous shadowle

The flexible wall, ceiling or trolley mounted SOLED15 is an LED examination light for multiple uses and places, e.g. first aid, minor surgery, intensive care, the recovery room, providing excellent light intensity from the IR-free light beam. With colour temperature (CCT) of 4.500°K, colour rendering index (CRI) of 95,

including ENT, head and neck, gynae-

cology, laparoscopy, general and vas-

cular surgery.

65.000 Lux (85.000 Lux with Boost function) and a low power consumption (16W).'

'The new SEL function allows the selection of single parts of the light beam and activation of the desired LEDs in a sequential way according to requirements and needs,' the firm reports. 'The Boost function, or





Research from the Centers for Disease Control & Prevention finds that 20% of respiratory Infections (e.g., the common cold) can be prevented through Handwashing

Preventing illness is in your hands.

Studies show that the #1 way to prevent the spread of dangerous bacteria & viruses is proper hand washing.

 Hand Hygiene Sanitizer Dispenser
Hand Lotion & Sanitizer Solution
Smart Hand Sanitizer Solution
Hand Sanitizer Dispenser Accessories Use Doctorclean® dispensers system throughout the day to help provide protection against the spread of germs

Ningbo Changqi Bathroom Hardware Industry Co., Ltd.

Website: http://www.doctorclean.com.cn Email: Changqi@doctorclean.com.cn Tel: 86-574-56202601 Fax: 86-574-56202600



the system has low power consumption and long life.

'The high technological level combined with the use of high-powered LEDs allow Soled15 to have a very linear yield and a negligible performance decay for its entire life duration,' Italian firm Acem Spa confirms. 'Thanks to the high efficiency achieved, Soled15 has a light intensity of brightness increase, is used to obtain a maximum light intensity in case of a wide light field. This approximate 20% increase deactivates automatically after five minutes.'

Soled15 has a light intensity of 65.000 Lux (85.000 Lux with Boost function)





Each demand is individual to fit an individual

Printing 3-D human parts

Everyone is unique – and so is human anatomy. Thus orthopaedics or implantology call for medical products that provide a perfect fit and demand is high for one-off components, or small production runs. At the same time, the materials used and manufacturing standards applied must fulfil extremely stringent quality control. This also holds for specialised surgical instruments and medical devices, which must be produced quickly and cost-effectively.

'EOS, the world's leading technology supplier in the field of industrial 3-D printing of metals and polymers, enables exactly this,' the company reports. 'Based on 3-D CAD data, parts are built layer by layer, by depositing powder material instead of, for example, milling a workpiece from solid block by removing material.

Enabling design-driven manufacturing

'Where conventional manufacturing reaches its limits, industrial 3-D printing permits a design-driven manufacturing process allowing producers to come up with faster, more flexible and cost-effective development and production methods. Unlike conventional manufacturing methods, 3-D printing as such allows for maximum design flexibility and functional integration. Thus, test series, prototypes, patient-specific one-off parts and small production runs can be manufactured at a profit.

'The medical sector recognised this and has been among the early adopting industries. Industrial 3-D printing is meeting their requirements, supporting both surgeons and patients. Different patient populations around the world require different parameters for surgical equipment and medical implants. With additive manufacturing, patient-specific designs are possible, paving the way





Prototype of a Plate Bender, used to contour plates for spinal surgery

'Orthopaedics adopted the approach very early on. So let's take the example of a professional rock climber who experienced a complex fracture in his ankle that couldn't be repaired.

'Through medical scans, an exact replica of the climber's ankle was reconstructed in a program that Climber and amputee C J Howard moves with his 3-D printed titanium climbing prosthetic, at Luther Spires in the South Lake Tahoe, CA area

communicated a specific design to the EOS system. The 3-D printing technology was able to create a part that closely matched his anatomy and, once implanted, the climber's recovery was quick because he had a more specific joint replacement rather than an ankle fusion or trauma plates that may not have allowed him to return to climbing.

'Beyond patient specificity, industrial 3-D printing also enables a greater complexity in surgical equipment design. EOS customer DePuy Spine had worked and partnered with leading clinicians and researchers for over 20 years to advance knowledge of both professionals and patients in addressing spinal pathologies and to develop products to treat spine disorders. Getting the right instruments to a surgeon who needs them can be an arduous process.

'Prototyping, revisions, materials selection, cadaver testing and manufacturing can create total wait times of many months. DePuy Spine was able to cut those lead times dramatically by employing the EOS technology.

Enabling design-driven manufacturing

'DePuy Spine was able to introduce a paradigm shift in part design, as such not designing for manufacturability anymore, but for functionality.' the company points out.

'The consulting doctors now can be very exact about their requirements for tools such as blades, racks, tweezers, and callipers. CAD designs can be adjusted more easily and another duplication of a tool can be made – instead of just one – to give doctors more choice and greater flexibility.

'Some opportunities the technology can offer are top in mind today: e.g. creating a point of care application, which is one of the many holy grails within the medical industry.

'Imagine being able to go to any hospital and have whatever ailment you had treated on the spot,' the manufacturer adds. 'There's still a long way ahead but it's becoming more feasible while we continue to focus on material advancements and the continuing improvement of the technology.'

* Further case studies: https://www.eos.info/ case-studies?category=Medizin





The easy-to-move rounded structure suits multiple medical areas



for an improved and

"custom serial production"

medical care.

to experience the precision of dtr medical sterile single-use instruments please contact us t+44 (0)1792 797910 e info@dtrmedical.com www.dtrmedical.com



EH @ MEDICA No 2 2017