TECH & INNOVATION

‘MY GOAL IN LIFE IS JUST TO HELP PEOPLE’

Israeli rehabilitation startup eyes Australia

GARETH NARUNSKY

AN Israeli medical technology startup is looking to bring its innovative rehabilitation system to Australia.

Motion Informatics CEO Gary Sagiv (Sugarman) is currently in Australia, visiting Melbourne, Sydney and Canberra, looking for local business partnerships to distribute the company’s rehabilitation technology.

The startup has developed the Spatial StimelMD (SSMD) system, which uses a simple device with electrodes that detect and strengthen weak neuron signals.

“Most people, or 80 per cent of our patients, are stroke patients,” Sagiv told *The AJN*.

“Our patent has the ability to take neurons from the brain which have already been killed by the stroke. There’s a little bit of neurons

The Spatial StimelMD (SSMD) system.

left, and these small and ‘dirty’ neurons are generated in the body, but they can’t do anything because they’re just too weak.

“So we capture them, we open them, we clean them, we put them back together again, and we do our therapy on those newly, newly created neurons.

“These neurons are called mirror neurons, and their job in life is to help the person move his arms, his legs, his fingers and toes by watching other people do it.”

The system combines biofeedback with functional electrical stimulation through electrodes placed on the patient’s non-active limb. Treatment sessions, recommended three times weekly for 30-40 minutes, can last from weeks to years depending on the patient’s condition and when treatment begins.

Motion Informatics is preparing to launch a new version of the device that adds artificial intelligence (AI), augmented reality (AR), and full telemedicine capabilities.

“The future machine … has AI, AR, completely digitalised telemedicine,” Sagiv said.

The system will allow patients, even in remote areas, to send therapy data directly to doctors and receive real-time guidance. The AI will generate personalised reports and tailor therapy programs to each patient’s needs. Through immersive AR games – such as playing soccer or casting spells with a wand – patients are encouraged to practise movements, helping to rebuild neural pathways. After a time, they want to [move], because they are so immersed in the AR,” Sagiv explained.

Sagiv sees Australia as an ideal market for the technology due to the country’s vast geography and rural healthcare challenges.

“This device is built for what I call rural communities where you might have a therapist a couple of hundred kilometres away that you might go and see once a month,” he said.

“We’ve just started here in Australia, we are speaking to a number of distributors of medical devices.”

He expressed particular interest in connecting with community members who have the capacity and reach to represent the technology nationally.

With just 10 employees, Motion Informatics has secured funding from India’s Bio-Rad Group and the Israel Innovation Authority, and has won several European innovation awards.

Sagiv emphasised that accessibility and affordability are key priorities. “Money should never come between good healthcare and your ability to get good healthcare,” he said.

“My goal in life is just to help people,” Sagiv continued. “My whole team is very passionate. We try to be socially responsible … and keep ethics and passion in what we do, because we’re helping people, and that’s why I think God put me on this earth.”

ISRAELI TEAM USES TOOL THAT FINDS FAKE ONLINE PROFILES

Algorithm detects abnormal protein activity

DIANA BLETTER

IN an intriguing study, a Ben-Gurion University of the Negev cybersecurity researcher who analyses fraud on social networks joined forces with biologists to develop a machine-learning system to recognise abnormal activity in protein networks inside the human body.

Their innovative method, weighted graph anomalous node detection (WGAND), uses an algorithm that uncovers suspicious behaviour in social networks to discover anomalous behaviour in networks of proteins inside cells.

The researchers said WGAND enabled them to identify proteins associated with brain disorders and heart conditions, as well as those involved in critical biological processes.

“It’s exciting to see how bringing together expertise from cybersecurity can lead to breakthroughs in understanding human biology,” said Dr Michael Fire, assistant professor in the Software and Information Systems Engineering Department at the university, who worked with lead researcher Dr Esti Yeger-Lotem, associate professor in the Department of Clinical Biochemistry & Pharmacology.

The study was recently published in the peer-reviewed journal *GigaScience*.

Fire said he and Yeger-Lotem “are on opposite ends of the BGU campus” and hadn’t met until the university announced it was offering grants for joint research projects.

“I work with people from other fields because AI has become an integral part of many different domains,” Fire said.

He was curious about how he could use his research in AI in computer science to help biologists explore interactions of proteins “like a social network”, he said.

Fire explained that in his work, he identifies atypical patterns among users in social networks to uncover fraudulent transactions or fake profiles. From this concept of connections in social networks, he said, “We move to networks in biology.”

Dr Esti Yeger-Lotem (left) and Dr Michael Fire of Ben-Gurion University.

Photos: Courtesy/Vered Chalifa-Caspi, Dani Machlis/Ben-Gurion University

Proteins in the body interact with one another in complex networks. Scientists can understand how they function and how they contribute to health and disease by analysing their networks.

This is where Yeger-Lotem’s work comes in. She develops and applies novel computational approaches in network biology, studying how proteins, genes and other molecules communicate.

The analysis of the interaction patterns among proteins, Yeger-Lotem said, can uncover which proteins play special roles, both positively and negatively, in tissues such as the brain and heart.

“Proteins don’t act alone,” she told *The Times of Israel*. “Basically, like any molecule, they act by interacting with other molecules. So we look at protein interactions and ask why they seem different in one tissue than in another.”

While there are other ways to study protein interactions, the researchers said that WGAND outperformed existing methods in terms of accuracy and precision.

“What is really cool about our method is that it is a generic algorithm,” Yeger-Lotem explained. “We can use it for predicting interesting protein behaviours, and in the same way, we can predict fake profiles or changes in a medical or transportation network.”

WGAND is open source, allowing researchers worldwide to utilise and build upon it.

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