

Tec professor presents biomechatronics advances at international forum



Joel Huegel, a research professor at **Tec Guadalajara**, participated in the **International Conference on Achievements in Biomedical Engineering (EIAIB)** with a presentation on the topic of **Manufacturing and Robotics**.

In a keynote lecture on **Biomechatronics - The Disruption of Prosthetic Technologies**, Huegel explained some of the lines of research that he participates in.

The research projects are undertaken at the **Biomechatronics Laboratory** on the **Guadalajara campus**, which is run by the professor himself and which contributes to:

- *Haptics*
- *Extreme bionics and development of next generation prostheses, particularly low-cost ones.*

The proposals made by these lines of research and projects are linked to **solving real social issues**.

During the visit of expert Hugh Herr (second from left to right) to the Biomechatronics Laboratory on the Guadalajara campus.



Biomedical engineering in Mexico and around the world

EIAIB is a conference that brings together **Mexican and international** specialists to publicize the importance and impact of **Biomedical Engineering within health sciences**.

It is organized by the Regional Research Center at the **Autonomous University of Yucatan** and the Applied Mathematics and Systems Research Institute at the **UNAM**.

At the latest conference, held at the end of 2020, virtual talks were given to share some of the **multidisciplinary work** carried out both within Mexico and around the world.

Those taking part included experts on Image and Signal Processing, Mathematical Modeling, **Artificial Intelligence, Neurosciences, and Bioinstrumentation**.

The EIAIB asked Huegel to participate as a result of **his work and collaboration with other researchers** and specialists in the field.

World-renowned expert Hugh Herr (left) accompanied by Professor Huegel (right), during his visit to the Biomechanics Laboratory at the Guadalajara campus.



Projects at the Tec's Mechatronics Laboratory

"Haptics refers to the sense of touch. This involves the entire proprioceptive system that allows us to understand where our body and limbs are.

*"It means we can find out how the body and its parts identify their position, and with what **force and speed** they're moving through a **neural control loop**," said Huegel.*

The neural control approach developed by the laboratory works by using **computer science and robotic systems** that interact with humans.

The lab is working on the development of functional, dynamic, and accessible **lower limb prostheses** for people that need them.

*"In Mexico, 80 people have an amputation every day: this leads to **discrimination and health problems**, as only 8 of those people have access to a prosthesis and only 2 to a functional model," he said.*

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In 2018, laboratory staff created the civil association **Tecnologías para la Comunidad** (Technologies for the Community) to work in conjunction with **Proactable**, a company created by former Tec students.

As a result of the **synergy from these 3 groups**, the team has been able to make **the use of low-cost and functional lower-limb prostheses** accessible to the community.

They are currently looking to generate **digital models and rapid prototyping** for mass production of **custom prostheses**.

*“Biomechatronics is an innovative and diverse discipline that **improves health** and people’s quality of life,”* concluded the professor.

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