PRoF Award abstract – Call 2018

Deadline for submission: Thursday March 1st 2018 (12 o'clock noon)
Please send to: PRoF-Award@uzgent.be.

AXILES BIONICS

1. Research Outline

Acronym	Axiles Bionics
Project name in English	Axiles Bionics
Pitch (1 sentence)	The New Generation Bionic Foot
Executive summary (max. 10 lines)	

Axiles Bionics is a Brussels based spin-off from the Vrije Universiteit Brussel (BE), striving to **improve the quality of life** of amputees by bringing the **next generation bionic feet** to the market.

Today's prosthetic feet are still the same as they were 30 years ago and fail at restoring a normal gait and posture. As an example, literature shows that up to 90% of amputees suffer from severe chronical back pain, which significantly affects their daily life activities. Things could be different!

After 10 years of research blending **advanced robotics, artificial intelligence** and human biomechanics, we have developed a new technology capable of recreating the unique combination of strength and flexibility of a human ankle. It is this technology that we will further develop and market with Axiles Bionics, the first EU company providing bionic feet to amputees.

2. Cause and context of the research

Each year, 75.000 people undergo a major lower limb amputation in the EU. The vast majority of these new amputees quickly discover that current prosthetic feet are unable to restore their full freedom of movement. As a result, amputees suffer both physically and psychologically. What if we could help amputees reclaim their lives with advanced robotics?

Over the past 10 years, researchers at the Vrije Universiteit Brussel have been combining insights in human biomechanics (MFYS research group), advanced robotics (Robotics & Multibody Mechanics research group) and artificial intelligence (AI Lab) to find novel ways to mimic the unique capabilities of the human body. A new generation of robotic feet is now ready to be taken a step further.

Axiles Bionics is a Brussels based spin-off, from the Vrije Universiteit Brussel (VUB), striving to improve the quality of life of amputees and bring the next generation bionic feet to the market.

3. Innovation results achieved

The aforementioned robotics research led to the development of new bionic ankle-foot prostheses, that unlike any other device on the market today, are capable of bringing back a natural gait and posture during daily life activities; being flexible and highly responsive to the person's intention and to the environment; and adapting and assisting during efforts by compensating for the lost leg muscles.

4 proof-of-concept prototypes were developed and validated with users. After clinical investigations, 10 out of 12 amputees showed strong interest in acquiring the bionic foot as soon as it is available on the market. 90% of interviewed prosthetists strive for better devices and believe our solution can help improve the quality of life of their patients unlike any other available prosthesis.

3 patent families cover the core technology used in these proof-of-concept prototypes that form the base for the initial and future products of Axiles Bionics. It is these patented, innovative systems that will bring amputees unmatched comfort and mobility.

4. Link to the PRoF values

The Axiles Bionics Spin-Off Project completely fits in the PRoF values. First of all, the main goal of Axiles Bionics is to provide better prostheses at more affordable prices to amputees (**flexibility**), young and old (**intergenerational**). As mentioned before, current prostheses still use materials and

technology that is (at least!) 30 years old. It is important to notice that most prosthetics today are even just a piece of wood. Providing these patients with a new device that acts, looks and feels like a sound foot plays a very important role in improving so-called SCC (**Safety, Comfort,** and Control). Improving prosthetics technology and functioning, and thereby improving amputees' quality of lives helps significantly to reduce **stigmatization** of losing a limb and helps them recover to a happier social life (**awareness**) without limitations.

5. Applicable IPR rules

IP generated by the different research partners remains property of that research partner. All IP at the moment is owned by the Vrije Universiteit Brussel.

1. Information on the partners

The 3 main partners are with the Vrije Universiteit Brussel and also part of Brubotics (www.brubotics.eu) : The AI lab, the Menselijke Fysiologie Lab and the Robotics & Multibody Mechanics research group.
At the moment there are 2 Post-docs, 5 PhD students and 12 master students directly involved in the research behind the bionic foot. Pierre Cherelle, the inventor and researcher/entrepreneur behind the main technology has been granted with an Innoviris LAUNCH grant 3 years ago to build a spin-off. At the moment, the project is in its fundraising process and will launch the spin-off Axiles Bionics by the end of July.

Note:
If your project is selected as laureate for the Award Symposium, a powerpoint presentation that reflects the project as suggested will be required (in advance), including a future plan how the funding will be used.
If your project is selected as the winner of the Award, you will be invited to present the results achieved thanks to the award during the Award Symposium of the next year.

Addendum: Contact information