

From primary healthcare to nanobots



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Excellence Scholar Giulia Amos wants to use her fascination with technology to benefit human health. She is establishing herself in the field by gaining practical experience and seeking out role models.

Gaming your way through your traineeship? Giulia Amos is doing just that. For four months, she has been working in ETH's Sensory Motor Systems Lab, which focuses on our sensorimotor control and the interaction between humans and machines. Her research is part of a project led by Florian Haufe and Michele Xiloyannis. The problem that the two postdocs are looking to address is as follows: while rehab patients dutifully perform their exercises in the clinic, they often tend to neglect them once they return home. There are video games that are designed to motivate patients by providing a fun way in to the exercises, but these are frequently deemed too boring and players tend not to stick with them in the medium to long term. On the other hand, existing movement-based games with more engaging gameplay are not specifically tailored to physiotherapy and rehabilitation needs. The aim of the team in which Giulia works is to adapt fun games so that they can be played as therapy. The aim is for the games to be usable also in association with exercise robots, developed in the lab. As a result, Giulia Amos is testing a broad range of games to see which would be suitable for rehabilitation purposes. The team is in talks not just with physiotherapists but also with potential partners in the games industry. The Excellence Scholar explains that the businesses were interested in the idea of improving the accessibility of their games for people with physical disabilities. The first demo versions are planned for autumn.

Role model found

Her traineeship in the Sensory Motor Systems Lab is not her first: at the orthopaedics company Mathys, Giulia Amos learned what is involved in bringing an implant to market from scratch and what project management means in the field of medical technology. "My 'problem' is that I'm prone to enthusiasm and interested in a whole range of different areas. Traineeships have been hugely helpful as they have given me insight into different fields," explains the Excellence Scholar. The field of rehabilitation instantly appealed, but she is also fascinated by the use of microtechnology and nanotechnology in medicine. She is, therefore, yet to make up her mind about the topic of her Master's thesis. She speaks highly of the tutor for her thesis, Simone Schürle-Finke, ETH Professor of Responsive Biomedical Systems – a role model not just as a result of her academic achievements but also because of her approachability and readiness to help.

The fact that the professor also seems to manage to strike a balance between family and a career in research has not escaped the Excellence Scholar either. Giulia Amos is aiming for a doctorate at the very least.

A human focus

The 24-year-old is not the only one in her family with an interest in natural sciences: her identical twin sister Samira is also studying at ETH – for a Master's in science, technology and policy with a focus on environmental issues. The two sisters grew up in Schwerzenbach in the canton of Zurich, and completed their schooling at the cantonal school in Uster. When Giulia Amos decided in 2016 to study health sciences and technology, it was the interdisciplinary nature of the programme and its human focus that appealed.

Asked about her longer-term aims, the talented young student points out the wide gulf between the highly developed medicine available in the industrial nations and the poor primary healthcare conditions found in other areas of the world. Giulia Amos's future plans therefore include being part of a project that makes good medical care accessible to more people. In autumn, she is heading to Nigeria, where she will spend three months carrying out research in the trauma ICU at the University of Benin Teaching Hospital.

Developing all-round excellence

Giulia was actually due to go abroad in 2020, but Covid put paid to the Excellence Scholar's plans. "I normally anticipate every eventuality. To have things not work out as intended and be forced to change my plans at the last minute was very unfamiliar ground for me." Sitting around twiddling her thumbs would not have been in Giulia Amos's nature. She ended up spending two months working in the Cantonal Pharmacy in Zurich, manufacturing hand sanitiser: "I was happy to be doing something useful during lockdown."

And what does she associate with the term "Excellence"?

"For me it's not just about academic knowledge. Aspects such as being a team player, taking responsibility and critical thinking are all part of it too. I want to develop in all of these areas, and the Excellence Scholarship is a wonderful support. I'm very grateful to have been awarded it."

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