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Student Profile: Alexander Impastato

MAJOR: B.S., ELECTRICAL AND COMPUTER

ENGINEERING

YEAR EXPECTED TO GRADUATE: 2023

CAMPUS: LONG ISLAND

HOMETOWN: OCEANSIDE, N.Y.

Mr. Roboto

New York Tech's [Entrepreneurship and Technology Innovation Center \(ETIC\)](#), an idea and innovation hub within the [College of Engineering and Computing Sciences](#), debuted the ETIC Research Robot for Student Engagement and Learning Activities ([E.R.R.S.E.L.A.](#)) in 2019. As E.R.R.S.E.L.A.'s [functionality has grown](#), so has the need to build an additional robot with even more impressive performance.

Backed by a [Voya Foundation education grant](#), New York Tech's [prototyping partnership with NASA](#), and [collaborative research](#) with the [College of Osteopathic Medicine \(NYITCOM\)](#), the vision for a new, advanced version of E.R.R.S.E.L.A.

(known as E2) is coming to life. [Electrical and computer engineering](#) student **Alexander Impastato** is co-managing its design as well as its mechanical and electrical systems.

Specifically, his work will enable E2 to have two arms functioning with the dexterity and precision of movement to be used in higher-level projects, such as assisting in remote-controlled robotic surgery. While E.R.R.S.E.L.A. could use only one arm to retract tissue during surgical procedures, E2 will be able to use both arms to assist in tissue retraction and suction. Also, by Impastato's design, E2 will be given a sturdier base than its predecessor, so it can more easily finesse movement around a surgical suite. Given E2's revised blueprint, the new robot will be more adaptable than its forebear for other functions and projects.

"I started showing up to the ETIC randomly when it was open," says Impastato of how he found himself working there in spring 2022. "I was assigned to work on a NASA Java project called HeartBeatID. From there, I worked my way up to the E2 project."

NASA's proposed HeartBeatID would use a person's heart's electrical signals as a new form of biometric authentication (instead of the more commonly used fingerprint or the basic ID card).

The aspiring electrical engineer first discovered his interest in the field when he participated in his high school's robotics club. As he participated in the club's activities, he noticed the correlation between robotics and electrical engineering. Impastato's experience has not been composed of all artificial intelligence mechanics, though—he has spent three semesters interning with rail transit construction company L.K. Comstock.

During his extensive time with the company, Impastato learned the details involved with circuit design as he detailed and revised circuit drawings for New York City subway signal systems on train tracks.

“The experience was all about implementing speed enforcement and autonomous computer driver control for trains on railroads,” he says. “Applying these skillsets to my campus project and career goals has taught me to think outside the box to solve a problem or achieve a goal.”

Among those skillsets are designing vital and non-vital circuit relays (elements used for train control), track circuits, interlocking switches, and experience with programming software. All of which will prove invaluable as Impastato pursues his Fundamentals of Engineering certification, master's degree, and future career.

Impastato says he is inspired by how engineering elements he's learned at work and in class apply to real-world scenarios. As he builds and experiments in his laboratory classes at New York Tech, he learned to wire circuits on breadboards—a device used to create circuits without the need for soldering (joining metals together)—and then applied those same concepts to the E2 project to make certain motors run.

Along with E2, which he hopes will be completed by March or April 2023, Impastato is working on his senior design project called “Aquabot.” Upon its completion, this robot will be able to water plants autonomously.

“Do not rush, do not be afraid to ask questions, and focus on one task at a time,” Impastato offers to students who wish to follow a similar path in engineering.

“Throughout this path, there were times when I wanted to give up. However, these thoughts have taught me that this path is going to get me far in my career journey. In life, nothing that is rewarding is supposed to be easy.”