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Microprocessor? Check. Actuators? Check. Mosfets? Check. I gather my components just as an artist gathers his paints. My work begins on the breadboard, each module taking its place in my creation. The odd-shaped parts are linked with colorful jumper-wires, slowly accumulating on the small board. The tangle of wires turns into a schematic diagram. This diagram becomes my map, and after several iterations, I open my design software and begin work on my circuit board.

Like words in a poem, each component is placed with much thought. I then start drawing the traces, like strokes of paint on my canvas. If I spot a mistake or see a better way of arranging my components, I clear my work and start again. Hours turn into days as the design evolves, each iteration better than its predecessor. Once completed, the board looks like a subway map from the year 3000. I apply my finishing touches and send it to the fab house for manufacturing. As soon as the boards arrive in the mail, the assembly process begins. I meticulously solder each component to the board, ensuring that integrated circuits are mounted correctly, and capacitors are not backward. Then comes the moment of truth. I connect the circuit to power and flip the switch. I stare intensely, praying that I don't see magic smoke hissing out of a chip. Fortunately, all is well, and the device joins my fleet of electronics projects.

This new device is Gestr, a low-cost wearable device that converts basic hand gestures into spoken text, primarily to aid the speech impaired. Due to nearly all cultures and social

groups using speech as communication, the lack of speaking ability can critically undermine an individual's ability to interact with their companions. Those who are speech impaired may be unable to find a job or live independently due to their condition, often resulting in mental illness such as depression and excessive paranoia. Through our technical knowledge, two peers and I set out to aid these people. After several months of work soldering chips and debugging code, we created a low-cost, easy-to-use product.

The development of Gestr catalyzed my passion for computer engineering and revealed its immense importance in society. The project walked me through the plethora of sub-fields and products Gestr's technology could be integrated with. As engineering is the bridge connecting ideas and theory to tangible innovations, it holds high importance within society.

Gestr illuminated upon the two-sided bond between technology and civilization. Technologies can address societal problems, improving quality of life and growth. For example, the AED, or Automatic External Defibrillator, has saved countless lives by providing medical assistance during emergency cardiac arrest situations. A world without such innovations would be calamitous by current standards. However, technology can be used to damage or destroy, causing or exacerbating current issues. The use of cellphones to detonate bombs and other explosives is a chief instance of this. This 'Dark Side' of technology is an idea engineers should seriously consider before embarking on a project. The ability to shift the progress of human society puts a colossal responsibility on the field of engineering. While projects like Gestr help those in need, tech can rapidly shift toward more harmful objectives. The same microprocessors that translate movement to speech can activate a bomb or infiltrate confidential meetings. Engineers must understand the power of their field and utilize their knowledge for societal improvement. This responsibility makes Computer Engineering an important field in the current day.

Engineering's ability to pilot societal development links it with another defining factor of civilization: art and culture. Projects such as Gestr break the notion that STEM classes are distinct from the humanities. Students and professionals in the field often say that engineers are artists at heart. While this statement is true, its scope is far greater. Engineering is the arts in action. Like many humans, I aim to create beauty with my work, and my projects are a manifestation of this thinking.

Such mentalities are common amongst engineers. A prime case of this thinking is within a statement from Elon Musk, founder of SpaceX, Neuralink, and many other businesses. Musk stated that his companies were like his children and will do everything in his power to keep them alive. Like many engineers, Musk sees the artistic value of his creations and will fight for their success.

During Gestr's design phase, my teammates and I pushed our artistic and creative abilities to their limits. We believe our prototype's artistic value is not due to its robustness or quality but because of the precision that went into it. Furthermore, Gestr's artistic value is within its purpose: helping those who cannot speak. Utilizing technical knowledge for a social cause is analogous to creating art to express emotion or encourage discussion. I believe that all technology is art in disguise, but tech that aids other individuals or groups truly shines.

The world of schematics, breadboards, and transistors is the artist within my engineering self. Every new project becomes my *pièce de résistance*, as it evolves from a forest of wires on a breadboard to a slick circuit board. Creativity is drawing the traces on the board design, then painting them again and again. Creativity is turning silicon and copper into a smart home or sign-language translator, like a sculptor turning stone into statue. Creativity is watching each component working in perfect harmony, knowing that you are the conductor of this orchestra.

When I press the power button, I can imagine the electricity zipping across the copper traces, like the blood coursing through our veins. The only difference is that this was my work, my creation. The feeling of creating something that can do is insurmountable. Not only is technology a work of art; it is art that works.

Gestr is not my first project and will certainly not be my last. The development and release of the device revealed the immense responsibility computer engineering has toward societal development. It illustrated the connections between the arts and sciences, subjects that are often on opposite ends of the academic spectrum. I aim to utilize Gestr as a springboard to a discipline with limitless possibilities. A profession where the arts and the sciences meet in the form of socially conscious and innovative products. A field that, quite literally, will push humanity to the stars.