For the first time in history, researchers are studying not just how the brain shapes us and changes the way we perceive the world, but studying how we can change the brain. Through calculated currents and magnetism, engineers are stimulating parts of the brain to treat abnormal brain functions. In response, the anatomical modeling software SCIRun released a brain stimulation package to make this study more precise.

SCIRun was created at the University of Utah and first released in 1998. Over the Spring 2018 semester, I took to learning this software for CREmedical. The poster attached shows the progression of my work. I began reading instructional manuals and wiki pages the Utah team had written to get a basic understanding of the program that is comprised of the input files being operated on by several modules (both shown top left). I was soon able to successfully operate stimulation networks based off magnetism and current, and analyze their impact on subscapular nodes (shown in the table on the right). I was able to build several networks including the surface node localization screenshots in the bottom left. These can give a better approximation of the relationship between node locations and impact stimulation there. By the end of the semester I was able to build complex networks like the FEM projection models (seen bottom right), which are able to display the differences in electric field values caused by internal bipoles.

The only credit I take for this project is that of learning and teaching. I am very thankful for the CREmedical team for welcoming me, inspiring me, and giving me an opportunity to learn more about the amazing field of neuroengineering. In addition I am thankful for the NIH and University of Utah for funding SCIRun so that it is a free tool available for the field of engineers and researchers to improve their study. Lastly, I am thankful for the Honors College for pushing students to their highest potential.

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