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| This week, I programmed in uCito to manipulate the graphics on a liquid crystal display handheld controller. I learned how to write text, change colors, and create key functions, boxes, dialogs, and widgets. On an unrelated note, I also updated more material properties and values in another XMD file to version two. |  |
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| This week I modified XMD files used to store information about materials (such as thickness, material type) and different processes to be used by CNC machines on said materials (such as cutting, engraving or rastering). I transferred data from an older XMD file to a more recent version, which included more compatible information to the newer software. I also began familiarize myself with programming the UI for the handheld pendants using uCito. |  |
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| This week I learned how to code Extra Tech's human machine interfaces using AngularJS and uCito in order to develop tools for the user to operate and communicate with a CNC machine from a monitor. I started with creating small scale projects such as programming dynamic web pages and toggle command buttons. Finally, I began worked on creating a web HMI for the company Vytek using the Coreo Command devel files used for another client as a template and altering the code based on a list of specs. |  |
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| I worked primarily on learning the AngularJS framework structure for coding application-based HMI (human machine interface) software that ExtraTech develops to meet the needs of some of their clients. I used a number of resources, including online tutorials, documentation, and even ExtraTech's own code. After learning the fundamental components of the AngularJS framework (i.e. Angular expressions, modules, directives, controllers, services, filters, routing, and data binding), I began manipulating the company's Core8.2 devel files as references and coding my own examples. |  |
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| This week I finished familiarizing myself with the Coreo CAD/CAM software suite as well as learning G and M codes for controlling CNC machinery. I also worked on learning the fundamentals and syntax of Extratech's proprietary macro language uCito for communicating directly with the machines using a terminal. I am currently working on reading through the companie's HMI and XML files and learning the JavaScript framework AngularJS for dymamic Web development. |  |

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| I enjoyed working on the controller UI the most. The learning curve was steep, but I enjoyed taking on a new challenge and having so many resources available (the uCito handbook, the init file and other MOD files, the wiki, and the employees themselves). Once I learned much about how to comprehend and write uCito code well enough by myself, I was given the project of making my own LCD interface. In this way, I was able to test my newly learned skill in an independent and create way. |  |
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| I enjoyed working on the handheld pendant interface. Even though I mainly played around with drawing shapes, writing text, and changing colors on the screen, I thought it was still interesting to see how my code code transferred onto a physical device. |  |
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| I liked programming the Vytek interface the most because I was given an actual task with a definite end goal. I also got to experience the process of real problem solving and debugging code. |  |
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| I liked programming my own version of some of the components on the Coherent laser tech company's "Coreo Command" interface because I was able to immediately see my changes on the page after I made them. Despite just adding dynamic input boxes and buttons on the page, I got to use tools such as Sublime and puTTy to program in a realistic company setting. |  |
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| I liked working with AngularJS the most because it gave me an opportunity to delve into more advanced client side web development in a professional context. |  |

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| I would say my least favorite project of this week was changing XMD files, just because it was something I had already done in a previous week. It was nice, however, to be given a project that didn't require as much prior explanation and which I could finish in the same day it was assigned to me. |  |
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| After a period of time, the work on modifying XMD files became monotonous because I had to duplicate processes and change the information row by row in order to add new ones. I did, however, figure out a method I preferred using a combination of SublimeText and XMD Reader, so after that it became more straight forward. |  |
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| The thing I enjoyed the least was having to get accustomed to my code having actual repercussions. Being able to operate a machine with my code in and of itself was awesome, but initially I was afraid to test run anything in fear of damaging equipment or being a distraction. Once I gained more confidence (and instruction) however, this anxiety lessened. |  |
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| My least favorite thing to work on was the very beginning aspects of transitioning gears from learning uCito syntax to beginning MVC (model view controller, i.e. a type of web framework/structure) development just because the learning curve for each was so steep. The tutorials and programming itself was fun, but the initial confusion was not. |  |
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| I really enjoyed everything, but working to familiarize myself with all ExtraTech's software such as CAD design was my least favorite simly because it was just learning to operate the programs as a user first to better understand it for future testing purposes. |  |

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| I learned a lot about the process behind coding ExtraTech's controller interfaces. This includes glcd (graphic liquid crystal) commands for drawing text, lines, boxes, and colors. In addition to this, I could make I/O functions, such as events triggered by a particular button press (keyfunc). Finally, I learned about the support macros defined in the init file which I could utilize to create and dynamically manipulate dialogs, complex "cBox"s, and widgets (which are groupings of elements that can be drawn or removed at once using different inputs from the stack such as 0 for update, 1 for draw, or -1 for remove). Each of these aspects contribute to the design and dynamic functionality of the interface which allow a user to easily access settings and run jobs on a CNC machine. |  |
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| I learned more machine processes and materials that are typically used in CNC machining. I also learned more about writing uCito macros and how to program handheld CNC controllers (ones with physical buttons), which differs greatly from programming the Coreo Command HMI (which is a web application). |  |
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| I was invited to sit in on a software team meeting, so I was able to see how deadlines are prioritized and how work gets managed at a tech company. I also learned a lot about bit masking, pointers, and calling CNC commands (namely how to run commands or check certain values/states then display that data to the user on an HMI). Additionally, I learned how to develop abstract, yet useful interfaces along with learning the value of good debugging skills. |  |
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| This was a learning-intensive week focused largely on dynamic web development. Essentially, I learned all about ways to bind and manipulate data in a dynamic way that keeps the company's data model separate from the Document Object Model (DOM), meaning that one could change text values in the HTML easily and variably without having to "hard code" changes. I also learned a lot about web services (protocols that access data from a server), .JSON files (JavaScript Object Notation, i.e. a lightweight data-interchange format), and routing (ways to navigate to different pages in an application without page reloading and will remaining a singe page application). |  |
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| This week I definitely learned a lot about AngularJS and model view controller (MV\* in general) frameworks. I had never really programmed in any other JS framework or library besides vanilla Javascript and some NodeJS before. |  |