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Machining 3D Relief Maps in VisualMILL

Jason Georgiades, the owner of Tropos Manufacturing LLC, is a prototypical American entrepreneur. Armed with large dreams, a sharp mind and the gumption to make those dreams a reality, he started down the difficult but rewarding path of starting a business from scratch. Located in Idaho, Tropos Manufacturing LLC is currently a part-time business: but Jason has bigger plans for the future. To sell his house, to move to Oregon, to buy the necessary equipment and software; these are the bold steps he is ready to take in order to transform his fledgling brainchild into a successful full-time business.

Jason and his child with his creation

Technically inclined, Jason attended the University of Idaho with a focus on Industrial Technology. As a student, he built hybrid vehicles. After graduation, he joined the company Sun Valley Bronze and headed their CNC machine shop. After months of manual programming the CNCs, he convinced his boss to buy an Australian offline programming system called OneCNC. Although it was a helpful program for beginners, Jason soon outgrew its modest modeling capabilities. He then purchased Solidworks for use in modeling, while using OneCNC exclusively for toolpath programming. However, problems arose when he attempted to translate files from one program to the other. Here was where Jason's search for alternatives first began: he liked Solidworks for modeling but he wanted something more reliable than OneCNC for toolpath programming.

During this time, Jason found a book detailing the process of building a CNC router. Ready-made CNC routers were available, but their prices were beyond his reach. Money was so scarce that Jason was forced to buy the drive box for his router on credit. At the end of it all, however, Jason built his router in his garage and continued onwards in the pursuit of jobs that would utilize his new tool. Still, OneCNC was a constant source of frustration; in his words, he was "starting to get sick of picking lines for toolpaths in OneCNC". Thus, Jason began to look elsewhere for suitable CAM software for use with his router.

Jason's home built router

Surfcam, Mastercam, Camworks, Delcam - Jason did his research on them all. At the end of the day, however, the fact remained that he simply did not have the funds to invest in such high priced products. Luckily, a friend of Jason's came to him with a recommendation: VisualMILL from MecSoft Corporation. Starting at under $1000. In addition to its low price, VisualMILL packed enough power to allay his concerns about return on his investment. In addition, MecSoft offered its customers with the option to upgrade to even higher levels of functionality at a later date. These factors convinced Jason that VisualMILL was the software for him. He ended up buying the product for use with his home router.

After using the program for sometime, Jason liked the program so much that he convinced his boss to forego OneCNC at Sun Valley Bronze and replace it with VisualMILL PRO. No file import problems have plagued him after the switch. In addition to the extensive surface and solid model machining capabilities, the STL file (stereo-lithography format files) machining ability in VisualMILL have been extremely helpful to Jason. Missing even in many of the more expensive products, this capability proved to be invaluable when Jason and his team began to machine laser-scanned parts from a Next Engine 3D scanner.

While working at Sun Valley Bronze, Jason met Tom Teigte of Ground Wire Studios. Teigte wanted Jason to make a bronze casting of the island of Kauai, Hawaii. They worked in conjunction with a GIS expert to create the G-code for milling the island. However, they were unable to account for the precise tool diameter and thus ended up with a machined model that was not perfect.

But Jason was convinced that there had to be a method of loading the map data directly into VisualMILL to create toolpaths. With a bit of experimentation, Jason managed to do so – using large STL terrain data files and machining them in VisualMILL. Tom returned a year later, with a new job: this time, he wanted to machine the entire state of Idaho. The final product would have to be four feet wide and six feet long.

A project of that size was too large for any of the mills that Sun Valley Bronze had: so Tom hired Jason and his team to complete the project at his personal shop. They began by loading STL format files containing 3D cartographic data of Idaho into VisualMill. Utilizing the powerful roughing and finishing methods available in VisualMILL, Jason machined the 3D shapes out of layered particle-board and wood. The model of Idaho was machined and completed in a few days. Some of the pictures taken during the manufacturing process are shown below.

Rough Machining the map of Idaho

Map after Finish Machining

Map details

Final painted map

Jason also uses VisualMILL and his homemade router to machine signage for a local sign and design company. "I used to try to program sign lettering on OneCNC," Jason comments, "but selecting every letter and direction of cut and side to cut on made the projects very frustrating." In VisualMILL, he merely has to select all of the letters and specify which side to cut. The system then automatically outputs the G-code. Jason also mentioned that "The V carving method is awesome and really saves the day doing sign work. I have found that of all the shapes to machine, text can be the most challenging. Sometimes you just can't pocket out text with a certain size end mill, so it's great to have the V carving option."

With a user-friendly interface and a fast learning curve, VisualMILL sacrifices none of its complex functionality by making the product easy to use. "The first time that I used it for sign lettering I was faster than if I had used my old program that I already knew," Jason said.
He also feels that VisualMILL is the only software in its price range that can import complex STL files that contain large amounts of information: the 3D map of Idaho being a prime example. "I actually had the entire state of Idaho in my workspace at full scale and then scaled it down to 4 x 6 feet."

Jason also commented enthusiastically about the associative nature of VisualMILL. He says, "I can always go back and change the curves or machining region of a toolpath and simply regenerate a new toolpath. Or I can go back and change the tool size of type and then regenerate." He is also excited about the bridging tab feature that was added recently to VisualMILL.

Jason's future plans now include converting diesel engines to run on straight vegetable oil and possibly an algae farm for bio-diesel production. He just got a plasma cutter that will enhance the capability of his CNC machine and will continue to use VisualMILL to program the tool paths.

When Jason was first introduced to VisualMILL, he loved it for its price. Now, after over 1 and ½ years of working with the product, he loves it for its functionality as well. He is also happy to report that his credit

card debts accrued during the investment phase of his home business have all been paid off - with the extra income from the jobs that he could take on with VisualMILL's help. We at MecSoft are proud that we have contributed to the success of one of our customers, and we wish Jason continued success in all of his future endeavors.