Mathematical CAM Craft: controlling machines not output
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In most applications of CAM (Computer Aided Manufacturing) the goal is firmly set on the output object. In fact, much of the power of techniques like 3d printing comes from the level to which they can act as a black box for manufacturing, significantly decreasing the amount of skill required to start creating physical objects. Of course everyone who has tried to actually create, quickly discovers that you cannot completely ignore the manufacturing process.

 In my first talk I will discuss how my desire to visualize mathematical ideas, and geometric thinking, lead me to take a different approach; embracing the direct control of the machine. I will outline the software package, CAMel, I developed (a plugin for Rhino/Grasshopper) to make this control as easy as possible and how I have used this approach to teach an interdisciplinary course on applied mathematics.

 In the second talk I will present my developing thoughts on a philosophy of machine control, implemented in CAMel, and how this might reduce some of the remaining barriers lying between digital content and physical objects, especially with a view on visualizing complex mathematics. This second talk will be partly speculative, but I believe this is the right audience to consider the mix of technical, abstract and practical ideas involved.