A Wooden CNC from Scratch: The True Established Mechanisms by Three Elements – Technology, Electronics and Software Are Out There!

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The challenge of this study is “to make a wooden CNC from scratch”. Normally, CNCs are made of metal owing to its high rigidity, however this time, I made it with wood, which is cheaper and easier to process than metal. The most serious issue of wood is its low rigidity, therefore, various kinds of problems happened, for example, vibration of the spindle that made machining very hard to work as expected. My solution is as follows: first, a coupling is attached between the spindle motor and the main shaft to reduce the vibration, then, the main shaft and a part of Z axis are made by using a lathe and a milling machine to keep the main shaft and end mill on a straight line with precision of ± 5μm. By applying ingenuity based on the causality analysis and utilizing the characteristics of wood, I solved many other problems by smoothly connecting the hard and soft-wares. For example, in order to avoid risks like end mill breaking, I made a software program to monitor the rotation of the end mill. In hardware, a limiter was attached to the end of each moving part (three axes). Even though the CNC I created is wooden, it achieved its performance to some extent by the skills coming from the feeling of sincerity and the search for precision to manufacturing. To think of this as a first step, I hope to combine such craftsmanship and state-of-the-art technology to create a new value.

Awards Won: