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Using open source software CNC controllers and modular multi-axis mechanical structure as integrated teaching environment for CAD/CAM/CAE training

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Abstract. Open source CNC controllers, such as Linux CNC are used more and more because they are open source projects and consequently are available for free. Moreover, these controllers are highly customizable, and their capabilities are close to the commercial solutions. The paper presents how using Linux CNC controller and a modular structure of a multi-axis CNC machine-tools, built by a commercial company, an integrated environment for training students in implementing CAM techniques was developed. Aside the CNC controller and the machine-tool, a CAM software package was used for programming complex machining operations. The kinematic model of the machine was built, for the user to be able to simulate, in a realistic way the multi-axes machining operations. The integrated teaching environment enable the users to be trained in CNC programming for three to five axes machining operations. Advanced programming strategies, such as tool center point management (TCPM) can also be tested.

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