

**Master 2016**

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**Optimization of Online-Programming Welding Process with 7-axis  
Kuka Robot.**

***ABSTRACT - Masterthesis***

The company SD Automotive is concentrating it's work on the production of prototype automobiles for companies such as VW (Volkswagen), Mercedes, Lamborghini, Opel and Ford. Since 1984 SD Automotive has been a steadily growing company, which works deeply with robotic programming for technical application. Through the use of online-programming of KUKA robots, a new generation of manipulator robot, the production of automobile prototypes can be done significantly safer. This strategy drastically shortens the development process because the structure can be analyzed beforehand, instead of spending time manufacturing prototypes. The programming of robots online, in this case KUKA 7 axes robots, has led to great improvements in vehicle productions, particularly in terms of welding, screwing, clinching, folding, etc. This is accomplished by the use of "Orange Edit beta software", which is controlled by a touch sensitive panel.

The main goal of this thesis is to establish the exact parameters of the KUKA robot's welding ability, as well as to determine the KUKA robot's ability to coordinate and synchronize with other robots in the production of a particular automobile model for VW, which is to be unveiled in close future. In the current program used to manipulate KUKA robots, the complete coordination of the robot's axes are calculated and correspondingly saved in the program. The program can also take into account several factors at once. For example, in welding the position of the compressor, necessary force, positioning of the welding guns, the current power being consumed by the "Düring" welding tool could all be accounted for. However, in reference to power consumption, an external controls cabinet running the program "BOS6000" is required to restrict the flow of electrical current to the welding tool.