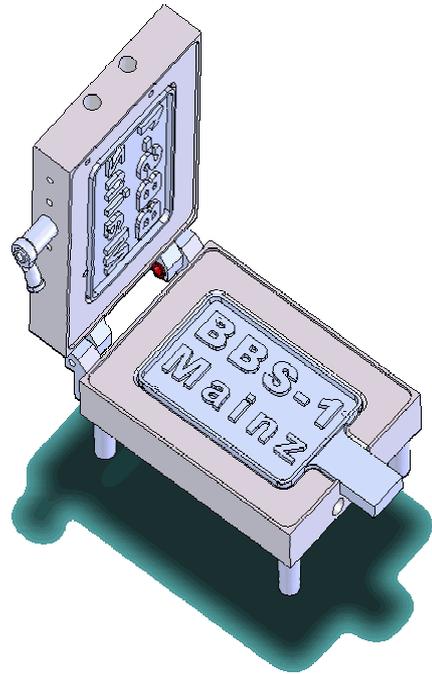


Welcome to the "automated waffles machine"

This website provides informations about the practice project of 4 students of BBS1 technical college, Mainz, Germany.

During the final year of the technical college while preparing for their final state examination in automation engineering all students have to plan, design and to implement a practice project on their own. As a result of this practice project finally the team has to present an automated application demonstrating the implementation of robotics engineering, control engineering, design, construction, sourcing, production and last but not least project management technics.



Almost on their own the students have the full responsibility for implementing their project. The students have to demonstrate their capabilities starting from the first planning until the final launch of the application.

The subject of the practice project presented on this site is the **"automated waffles machine"**. The navigation buttons on the left will guide you through all subjects touched by this project.

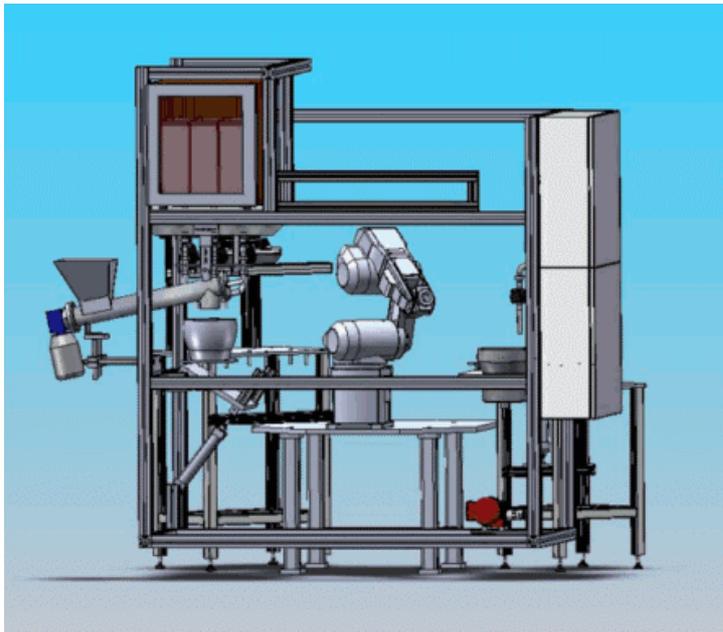
The final presentation will take place during an 'open house day' at the BBS1, technical college, Mainz on Saturday, 7 February 2009.

All interested parties are welcome to assess the results of the students works of the last few months during this day.

The Project

The automated waffles machine is a full automated application for preparing fresh baked waffles with individual selectable topping. The application consists of control logic, supply for dry and liquid ingredients, a mixing device, an electrical waffle iron and a touchpanel user interface.

The production process of the waffle with a selected topping is fully automated and runs computer controlled without any manual intervention.



The Procedure

At the touchpanel the user orders the waffle with a topping of his choice. The ingredients such as flour, baking-powder, sugar, egg, butter and milk are fed from their storage container into a bowl. The dosage of the ingredients is measured by a weight sensor.

For mixing the ingredients the bowl is being moved by the robot to the mixing device. The final dough is then being filled by the robot into the liquid dough container.

The syrup like dough is fed from the container to the waffle iron controlled by another weight sensor for correct dosage. The robot moves the filled waffle iron into the heating frame and the top cover of the waffle iron is placed on top of it by a pneumatic access. At a precise temperature of 205° C the waffle is now getting baked.

The ready baked waffle is placed by the robot onto a paper plate. The selected topping is added and the fresh baked waffle gets served.