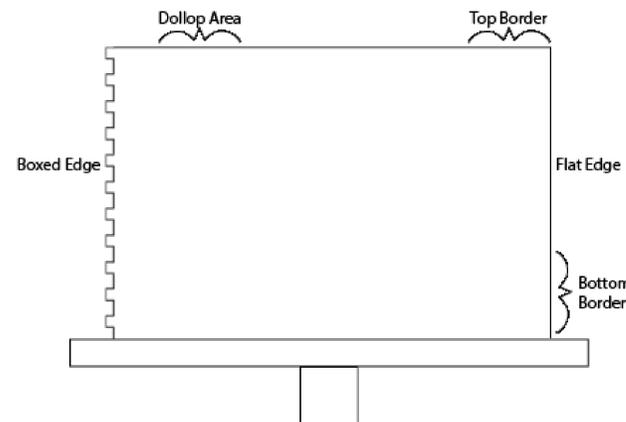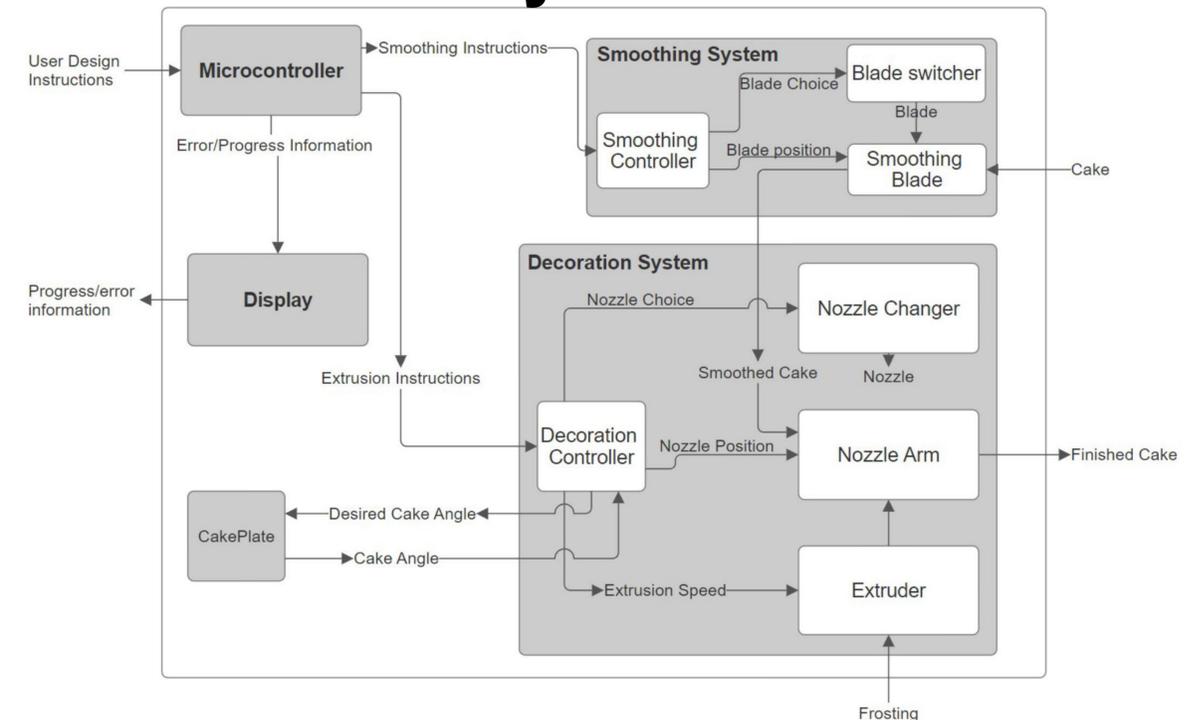# CakeBot

Automated Cake Decorating

- CakeBot is an automated cake decorating machine that can frost the exterior of a cake, smooth the outside with a blade and decorate the cake with border patterns and dollops.
- Users can select border patterns for the top and bottom, a finish for the cake(flat or boxed) and can use 4 different nozzles to further vary the appearance of dollops and bottom and top border decorations.

System

Methods

- CakeBot approaches cake decoration like 3d printing. There are six stepper motors controlled with a microcontroller. The system uses these stepper motors to control cake rotation, blade height, nozzle height, nozzle angle, and cake x-axis movement.
- Frosting is extruded using a linear actuator. The linear actuator is controlled via Pulse Width Modulation(PWM). This allows for accurate flow control of the frosting.
- An automatic calibration process uses switches to find the positions of the carriages being controlled. The User can then use buttons to define the radius and height of the cake.
- Software turns the stored radius and height of the cake into instructions for the stepper motors.

Conclusion

- CakeBot can decorate any sized cake using a calibration process performed by the user without having to reload the frosting canister.
- Users are able to change the appearance of cake decorations by swapping out nozzles and changing the orientation of the blade,
- The system requires a lot of force to push the frosting through the nozzle. This could be improved by shortening the tube from the linear actuator to the nozzle, and by using a tube with a wider inner diameter.

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