Final Project: Toast-it Notes

Materials:

2 Regular RC Servos

raspberry pi, power chord

approx. two big pieces of plywood

nuts, axles,

modified soldering iron as heating element

toast.

Written Description:
The proposed project is a user controlled printer, also known as a toast-it-burner.
The appliance consists of three servos, which control the x and y position of a platform with the toast as well as the heating element in the z axis.
From top comes a heating element which can be lowered onto the toast with a third servo.
By moving the toast in the right manner with the right speed, text can be burnt on it. The movements are calculated by a control unit. Creating a toast-it works as follows: The user executes the program and enters the text to a command line which is connected to the control unit (raspberry pi) via SSH. The control unit switches on preheats the heating element, calculates the necessary movements of the toast to burn the desired text, and continues to move the servos accordingly while continuing to heat the heating element. A toast-it is written. The heating element is a soldering iron and controlled in the vertical direction by a servo.

Team Roles:
Tyler: Everything with electronics:

- Servo coordinate mapping,
- Implementing servo control functions,
- Storing the toast font
- Design Heating Element

Viktor: Everything not with electronics.

- Design wooden frame with two degrees of freedom.
- Design the drive of the platform
- Build it.
- Design the mount of the heating element

Milestones

1. Build Hardware out of wood:
    - two carts on rails, toast platform movable in x and y direction
1. Attaching Servos, control position of platform
2. Map coordinates to servo positions
3. Create Font for printing
4. print single letters on toast
5. print toast-its

Risks:
1.The heatflow is not high enough to create readable letters

2. The control of the toast is too complicated to write letters

3. the toast starts burning every time

4. the contact of the heating element is not constant

Fallback Plans:
to 1.: Heatflow not high enough? Build different heat elements. Worst case: build own heat element

to 2.: Build better control unit. Only write single letters

to 3.: Build heat element with bigger surface

to 4.: Build a different construction which applies a light force to the heating element downwards.

Grades:
A: Write actual letters on toast

B: Control cart precisely to write letters

C: Control movement of cart for rough letter writing

D: Buy toast

Mockups: