Project Proposal: Mood-Drawing Robot

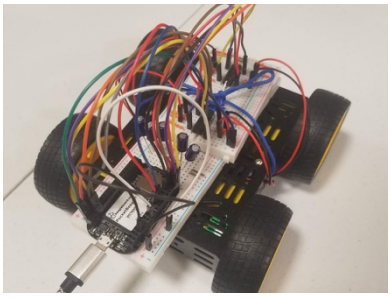
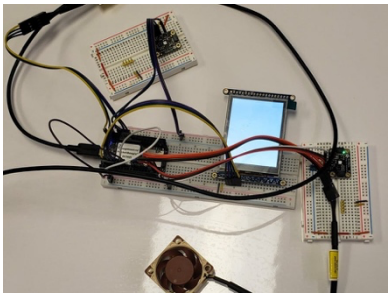
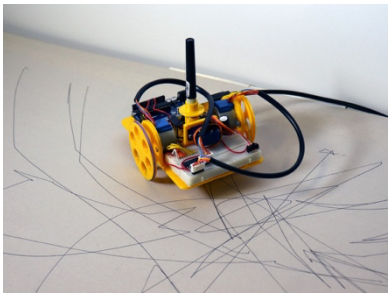
I. Background Information

My project proposal is this: a mood-drawing robot. This project was inspired by the idea of a mood ring. Mood rings are fun accessories that change color based on the temperature around them. Typically, this is associated with a person's body temperature because mood rings are worn as rings or even necklaces. These colors are each associated with a mood, so the ring tells its wearer how they are feeling. My robot would work in a similar way by measuring the user's body heat then drawing an emoticon to tell the user their mood.

The basic structure of my robot is two wheels and a balance peg connected the outside of a chassis. The two wheels are driven by two independent motor drivers, which allows the robot to drive forwards and backwards as well as turn. At the center of the chassis is a pencil connected to a servo that moves the pencil up and down. As the robot drives, the pencil is either in the down position, which drags the pencil across the surface underneath the robot, or it is in the up position, which leaves no mark. This allows the robot to draw emoticons that correlate with four moods (happy, sad, angry, and neutral). Also on the chassis is a temperature/humidity sensor. The robot uses this to measure the user's body temperature and sort the temperature into one of four ranges, which each correlate with one of the four different moods. Finally, somewhere on the chassis, the robot holds a blue LED, a yellow LED, and two buttons.

The user experience is as follows: The user places their palm over the temperature/humidity sensor. The user presses the 'measure temperature' button. The blue LED comes on. The palm temperature is read and the blue LED turns off. The user removes their hand and moves the robot onto a piece of letter paper. The user presses the 'draw mood' button. The yellow light comes on. The robot draws a happy face, sad face, angry face, or bored face. The drawing is finished and the yellow LED turns off.

Some inspiration for this project include a voice-controlled toy car, a two-zone fan-thermometer system, and another similar drawing robot.

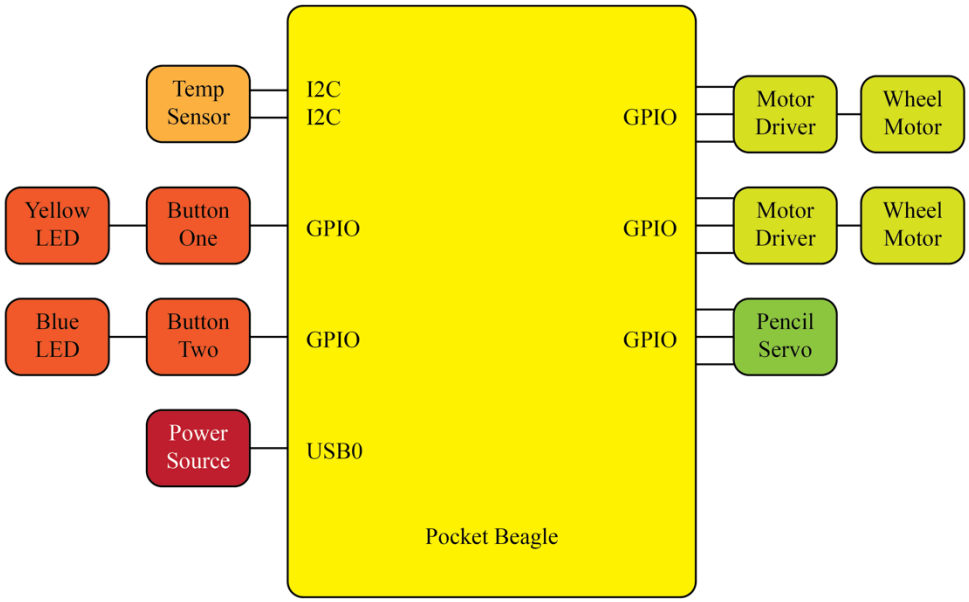
voice-controlled toy car: https://beagleboard.org/p/jae-kim2/voice-controlled-toy-car-fcd8af#comments

two-zone fan-thermometer system: https://beagleboard.org/p/brian-dinh-rice2021/rice-university-engi-301-project-1-icyhot-7e1a75

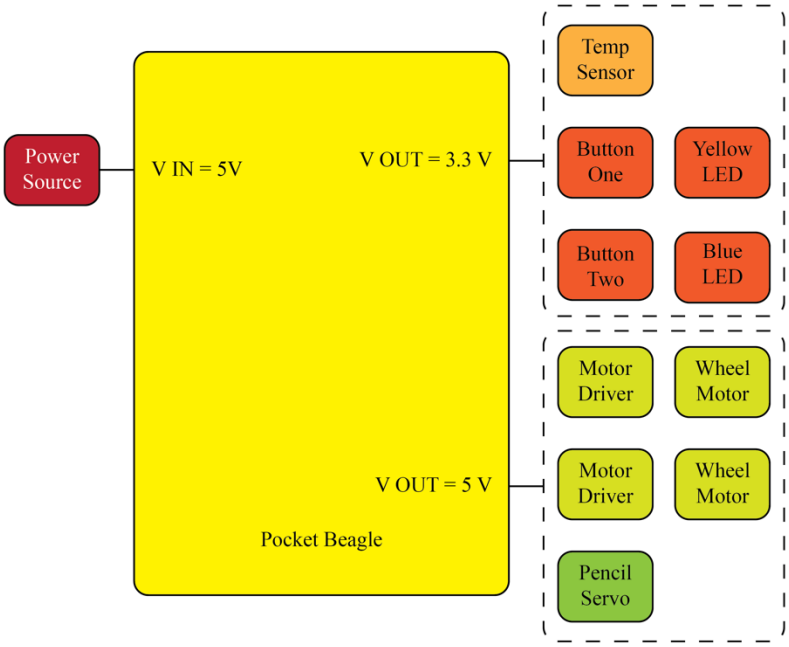
drawing robot: http://ciid.dk/education/portfolio/idp19/courses/physical-computing/projects/i-drawing-robot/

What makes this project different than these other projects is first that the robot is preprogrammed with the specific face shapes rather than responding in a random-looking or left-right-up-down manner and the second is that the project plays with the idea of mood and leaves the user free to explore changing their body temperature (via ice for example).

II. Block Diagram



III. Power Diagram



IV. Components / Budget

Component	Need to Buy	Cost
Pocket Beagle		
Solderless Breadboard (Half)		
Solderless Breadboard (Full)		
Jumper Wires (generic)		
Resistors (generic)		
Capacitors (generic)		
2 Buttons		
Yellow LED		
Blue LED		
Servo		
Pencil		
4 Wheels w/ Motors (2 extra)	X	$15.99
2 Motor Drivers	X	2x ($3.08)
Temperature Sensor	X	$10.49

Set of 4 Wheels with Motors:
https://www.amazon.com/Plastic-Wheel-Motor-Shaft-Arduino/dp/B07P9Z4T2K/ref=pb_allspark_dp_sims_pao_desktop_session_based_5/140-5810034-4382908?pd_rd_w=UmYMl&pf_rd_p=e896123b-6614-49c5-873e-d532e726c2f0&pf_rd_r=WXWAPRKB9NMF7J338AH8&pd_rd_r=e996df2e-10ea-4b32-86d0-0ad435f96792&pd_rd_wg=bdcAd&pd_rd_i=B07P9Z4T2K&psc=1

Motor Driver:
https://www.ti.com/store/ti/en/p/product/?p=L293DNE&utm_source=google&utm_medium=cpc&utm_campaign=asc-null-null-OPN_EN-cpc-store-google-wwe&utm_content=Device&ds_k=L293DNE&DCM=yes&gclid=Cj0KCQjwqp-LBhDQARIsAO0a6aLwfSipCOdPTNo-rOsS5Zv2SxNhVfJO4tXOTrcd1iwNQ3Dh9sDeMJYaAmpJEALw_wcB&gclsrc=aw.ds

Temperature Sensor:
https://www.amazon.com/Adafruit-Si7021-Temperature-Humidity-Breakout/dp/B01M0BJ139/ref=sr_1_3?crid=2IXFFKHQHEJOG&dchild=1&keywords=adafruit+temperature+sensor&qid=1634226016&sprefix=adafruit+temper%2Caps%2C175&sr=8-3