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Human Following Using Kinect V2

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The Smart Personal O

& Scholarship
POSIUM

Hum

SPOT

bject Transporter (SPOT) was

an Following U

Tori Handley, Nate T

Abstr

With the emergence of continuo

Using the Kinec

Titus, Josiah Watson

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usly improving imaging

ct v2

School of
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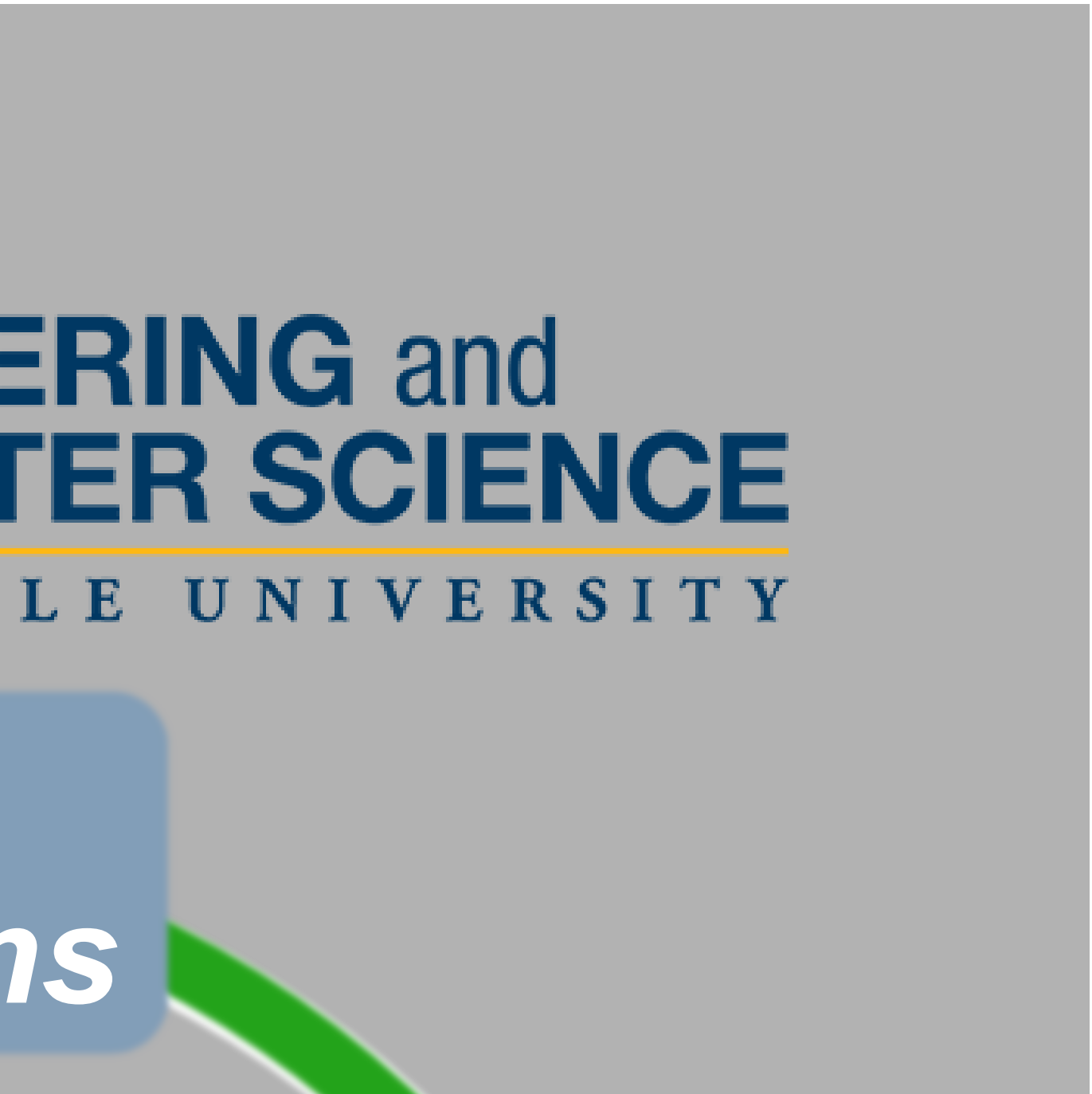
Potential
Applicatio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TER SCIENCE
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designed to carry item
autonomously, with no
primary challenge in t
where the user is with
approach was to try to
image processing inste
electronic device, whic
projects went.

Kin

ns for the user and follow them
o interaction from the user. The
his project was determining
n respect to the robot. Our
keep track of the user through
ead of making them wear an
ch is the route other similar

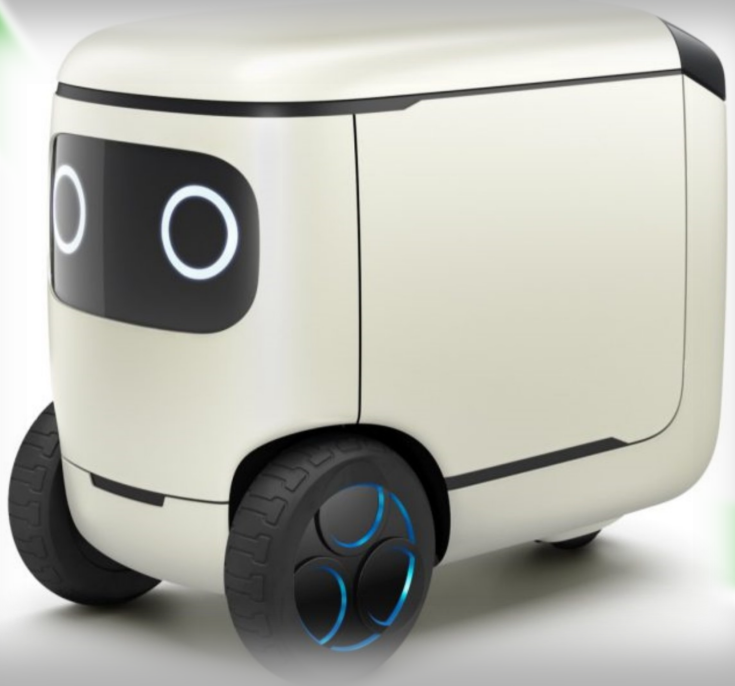
nect v2

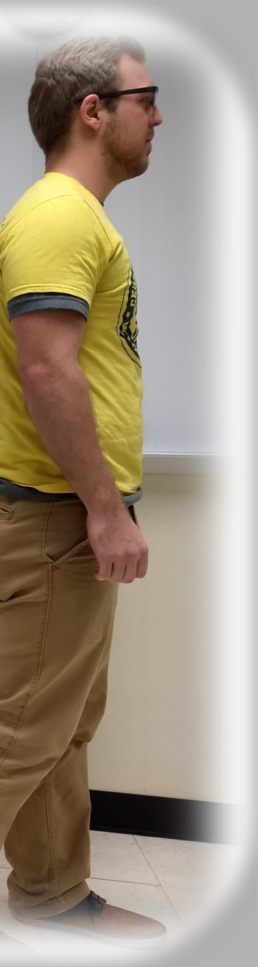
3 Image Sources

- RGB Camera
- Depth Sensor,
- Human Tracking

and image processing technologi
of applying those technologies t
make navigational decisions base
this project, a human-following r
implemented using the Microsof
PC. This system feeds the robot
information from the environmen
it to navigate obstacles and follo
Kinect is used to find the user's l
the robot, based primarily on wh
where the user was last seen. Thi
the on-board PC, which uses it t
decisions and drive the robot's w
communication with a PIC18 mi
system could be used in a variety
shopping carts, airport luggage c
pets.

ies comes the challenge
o create robots that can
ed on visual inputs. In
obot is designed and
t Kinect v2 system for
both color and depth
nt in front of it, allowing
w a specific user. The
ocation with respect to
at the user is wearing and
is information is fed to
o make path-planning
heels through
crocontroller. This
of applications, such as
carriers, or even robotic





The Microsoft Kinect v2 is the second version of a sensor that was originally developed as a hands-free video game controller. Because it gathers both colo and depth information, the Kinect is uniquely enabled to track people in its field of view. The Kinect v2 improve upon its predecessor by increasing camera resolution and distance sensing range.

Automate

Using the Kinect's abi

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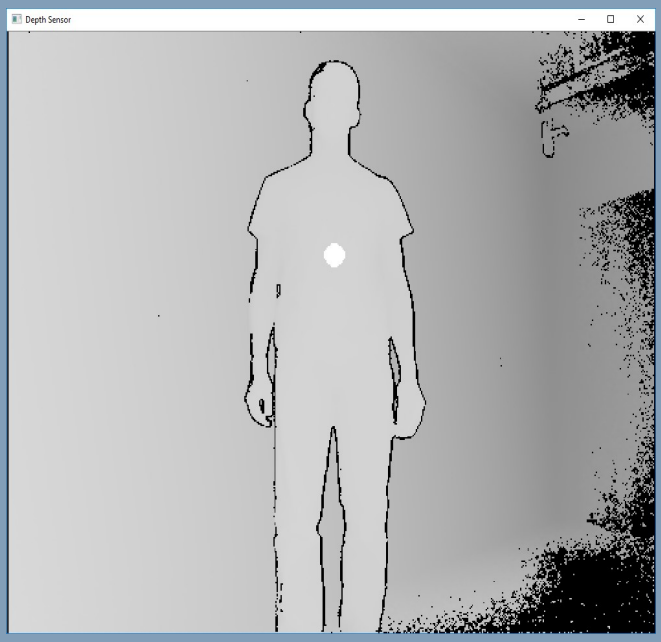
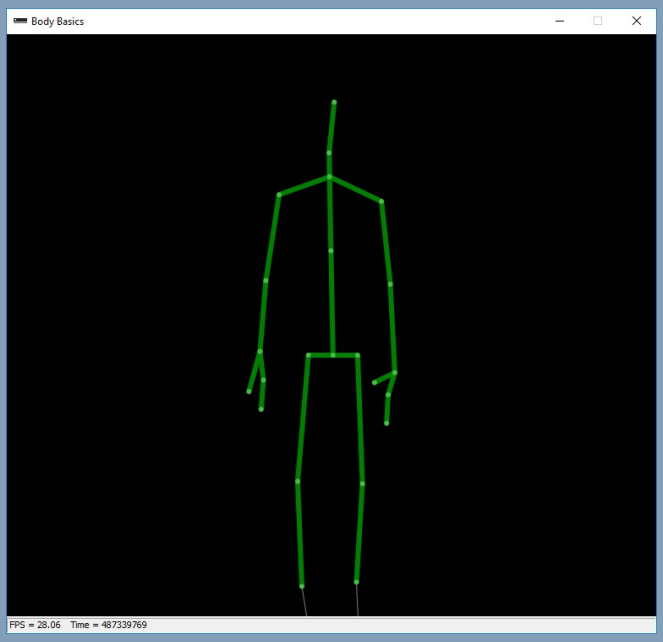




ed Thresholding

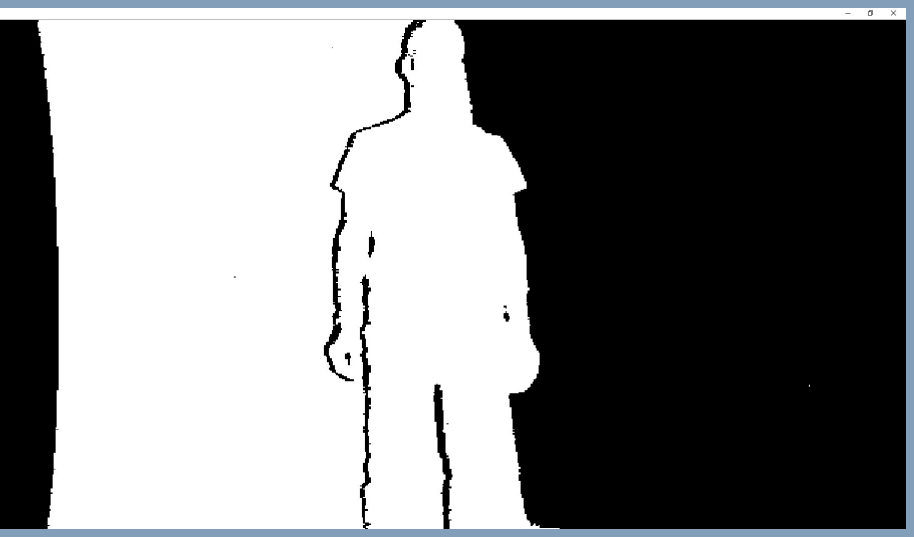
ility to track people, the robot

Filtering th

For every single camera frame, e
Saturation, Value, and Depth) m
the determined threshold values.
combined to form a filter for the

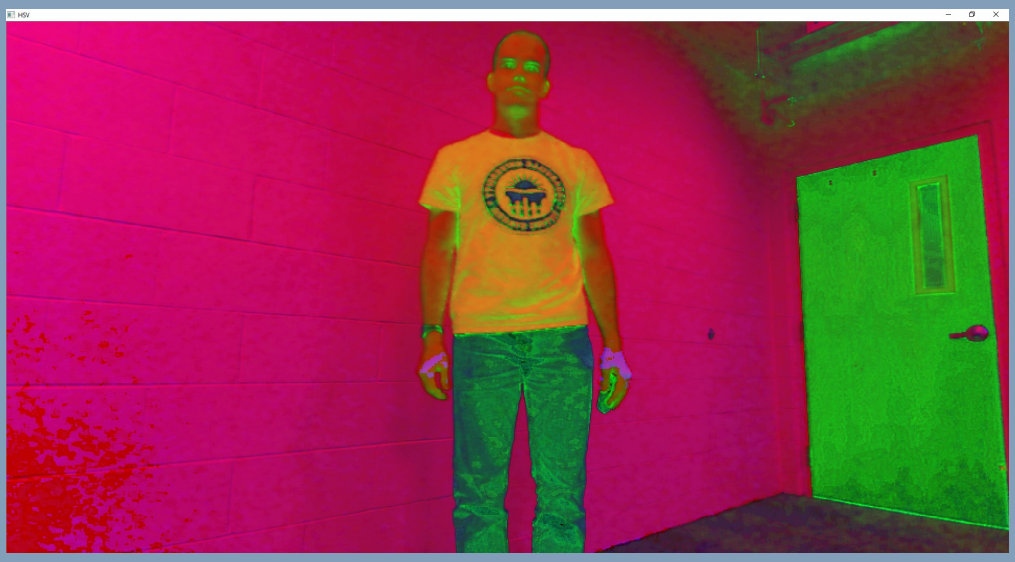
e Image

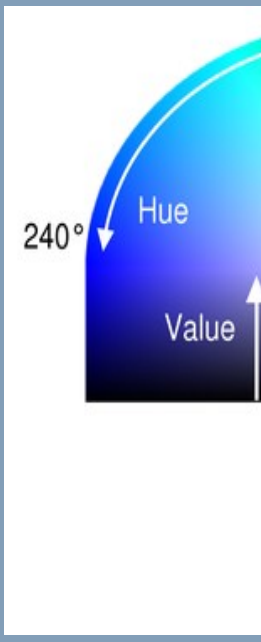
ach channel (Hue,
ust be filtered based on
. The resulting images are
current camera frame.



Hue-Saturation

Why HSV? HSV allows for a more ro
determining color than RGB, as it is
much by lighting





Finding the U

Once the user's shirt has been located, th
the Kinect's depth sensor to determine ho

n-Value

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not effected as

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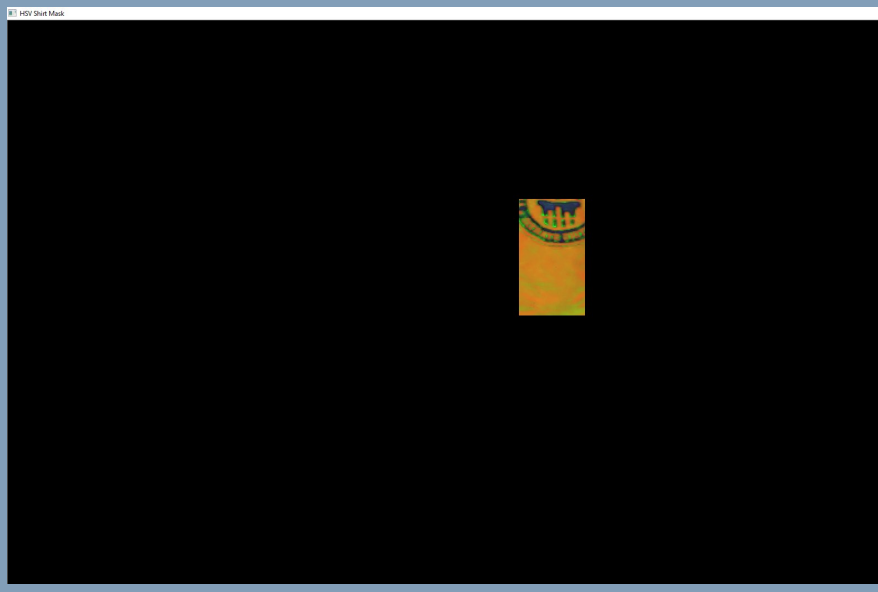
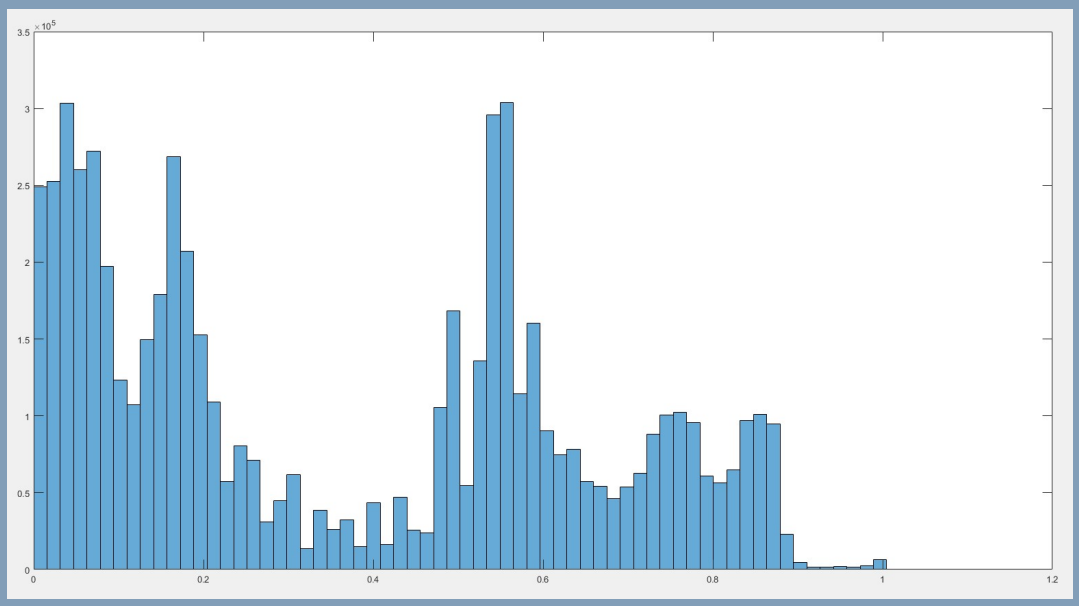
e robot uses
ow far away

Using the Kinect's abi
sets threshold values b

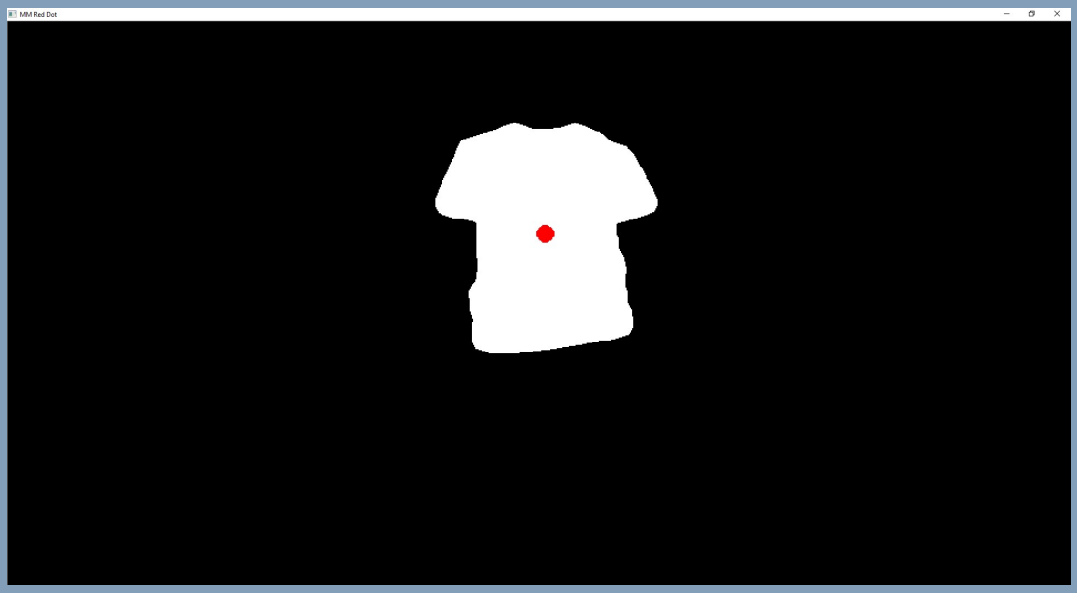


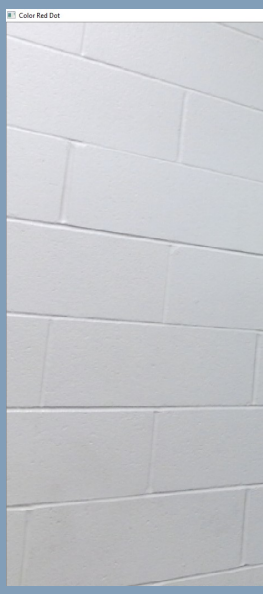
ility to track people, the robot
based on the user's shirt color.




Masked Color

the user is, which determines how the rob
move.





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