RAVEN Instructions – Basic Demo

# Turning On the RAVEN:

* Turn on the computer (2nd box from the top on the stack)
* Boot computer using the default options
  + The password is: RavenII
* Once the computer has started up, turn the power on (bottom box in the stack)
  + Note: turn the 48V switch on first, flick switches upwards to turn on
* On the computer, open a terminal
  + Run command: cd raven\_18\_05
  + Run command: source devel/setup.bash
  + Run command: roslaunch raven\_2 raven\_2.launch
* Press the red e-stop button (if not already pressed) and then twist it to reset
* Press the silver button (next to the e-stop button)
  + At this point the arms will begin homing, which means all of the joints will move to their limits
  + This should all happen autonomously, but be ready to press the e-stop if it looks like something bad is going to happen.
  + If some joints don’t quite reach their limits, that’s okay

# Changing to Sinusoid Mode:

* After the arms have finished homing
* In the open terminal:
  + Press: “m”, then “7”, then “enter”
* Press the e-stop, twist the button to reset it, then press the silver button
  + The arms will now begin sinusoiding
  + Press the e-stop to stop the demo

# Turning Off the RAVEN:

* Press the e-stop button (if not already pressed)
* In the open terminal, press: “ctrl+c”, then close terminal window
* Switch the power off (switches on bottom box in stack)
* Switch computer off (press power button on box, then choose shut down on the screen)

RAVEN Instructions – Teleoperation

# RAVEN PC: (Desktop PC)

* Click on the networking icon at the top right (wifi symbol or and up & down arrow); then select static network 192.168.0.111 from the list
* Start RAVEN as normal
* After homing, press “m”, then “6” in the terminal to put the RAVEN in manual mode
* Press the e-stop, reset and press the silver button

# Haptic Devices:

* Position the haptic devices where you can use them comfortably
* Turn the devices on (power switches are at the back)
* Calibrate the devices:
  + Bring the handle down and towards you so it fits into the notch at the front of the base to start calibration
  + Let it return to the neutral position
  + Move the free DOFs to their limits (roll pitch, wrist roll and gripper)
  + Continue to move the DOFs in turn until the light on the base stops blinking

# Teleop Station: (Laptop)

* Double click on the GUI\_Server shortcut
* Double click on the Mantis\_client.exe shortcut
* In GUI\_server window, use the mouse to input your PIN, then click enter
* Click the engineer tab at the top, and select the IP (‘QUT’) from the dropdown list
* Set the scale to 0.3
* Click Start
* The RAVEN can now be controlled using the haptic devices, press the foot pedal (middle) to disengage the brakes and get the robot to move
  + Note that you can move the haptics around freely while the foot pedal is up to reposition in case you get uncomfortable or need access to more of the workspace
* You can open a camera stream to get a better view, instructions for this can be found in the follower demo instruction sheet

# Turning Off:

* On teleop station, close both of the programs but leave the computer on
* Turn the haptic devices off
* Turn the RAVEN off as normal

RAVEN Instructions – Advanced Demos

# Start a Camera Feed:

* Open a new terminal (ctrl+shift+t)
  + Note: will only work if you are currently ‘clicked in’ to a terminal window
* Run command: rosrun uvc\_camera uvc\_camera\_node
* Open a new terminal
* Run command: rosrun image\_view image\_view image:=/image\_raw
  + This will open a new window showing the camera feed
  + This window can be moved and enlarged using the mouse
* To stop the camera feed, press ctrl+c in both terminal windows

# Follower Demo:

* After homing, press “m”, then “6” in the terminal to put the RAVEN in manual mode
* Press the e-stop, reset and press the silver button
* Open a new terminal (ctrl+shift+t)
* Write on the terminal line: rosrun follower\_demo follower, but do NOT run yet
* Ensure both the arm and object are in view of the camera
  + The arm can be moved by hand whilst pressing the brake button on the side of the arm (next to the 9V batteries), and by pulling the cables to adjust the end effector
  + In the ‘roslaunch’ terminal window, press ‘d’ to audibly disengage the brakes
* QUICKLY go back to the last terminal and run the pretyped command (rosrun follower\_demo follower)
* Press ‘enter’ to start the program
* Press ‘6’ to make the arms start moving (pressing ‘6’ again will pause/continue the arms)
* The speed of the arm can be changed by pressing ‘3’ to increase it, or ‘4’ to decrease it
* If the arm doesn’t move, the brakes may have re-engaged before the program was started, simply stop the program (ctrl+c), disengage the brakes again (press ‘d’ in roslaunch window) and run the program again
  + Note that pressing the up arrow in a terminal will load the last command
* The object (animatronic eyes) can be controlled using the remote control
  + Use the left joystick to move up/down, and the right to move left/right
  + You will need to power the eyes using a Li-Po battery
* Stop the demo by pressing ctrl+c in the terminal window

# Haptic Demo:

* Turn on and calibrate the haptic devices (only the left one is required)
* On the teleop station (monitor input = DVI) double click on the emporium.exe shortcut
* The device can be used to move the ball around the screen and interact with on-screen objects, closing the gripper will move to the next stage of the demo
* Press ‘Esc’ to exit the demo