RR2 Setup Instructions

School Information

GraceWorks (5 kids)

- Address: 160 High Street, Medford, MA 02155
- Phone: 781-306-0060
- Schedule: Wednesdays 9-11am (olga)
- Parking is in the back of the church. The entrance is also in the back. Ring the bell to be let in.

Make Way For Kids (7 kids)

- Address: 489 Winthrop Street, Medford, MA 02155
- Phone: 781-393-2210
- Schedule: Mondays, Wednesdays 9-11am (jackie)
- In the same building as Medford High School and Medford Vocational School. Park on the vocational side (righthand parking lot). The entrance is by the flagpole. Sign in at the main desk to get a visitor badge.

Lynch Elementary (32 kids)

- Address: 10 Brantwood Road, Winchester, MA 01890
- Phone: 781-721-7013
- Schedule: Mondays, Tuesdays, Wednesdays (olga), Thursdays 1:30-2:40pm (more times TBD)
- Start day: March 12
- March 12 1:30-2:40, March 13 1:30-2:40, school has parent-teacher conferences March 14, 15, 16
    - Ask about morning schedules for mondays (preschool + Bergeron class)
- March 19 - March 23: MTWTh 1:30-2:40,
- Main entrance is to the left of the drop-off circle. Ring the bell to be let in. Sign in at the office.

McGlynn Afterschool (5 kids)

- Address: 3002 Mystic Valley Pkwy, Medford, MA 02155
- Phone: 781-866-1063
- Schedule: Wednesday 2:30-4pm
- Main entrance is covered, far end of the parking lot from where you drive in. Sign in at the office.

Before you leave for the school, make sure you have

- Folders with all protocols and log sheets
- Equipment bag/box of fully charged devices (see equipment list)
- Robots! (see equipment list)
- Your laptop and laptop power adapter

When you get back

- Plug all devices into chargers!
    - Charge tablet and S7 phones in the box.

- Put the mac mini in the box too, plug it into power, and turn it on (so Jackie can ssh in and update stuff in between study sessions)
- Upload all rosbag, video, performance logs, and child photos files to the appropriate places in the google drive folder:
    - https://drive.google.com/open?id=1Aw1xzWcc40q3QLVzkP0YgLVP-RGmNHAv
- Update the RR2 Experiment Log in the RR2 Data google drive folder: https://docs.google.com/spreadsheets/d/1lgEea-4tRltf44kKjDXmj5ZPCAjQX7uMUL7-PdwPL9c/edit?usp=sharing
    - Update the Overall Log with the date and success/fail information for each participant.
    - Update the Session Log with all the information you recorded during the Session's pretests and posttests.

Equipment Setup

Area setup

1. Find a power outlet. Plug in a power strip. Use an extension cord if necessary.
2. There should be a table available. Move it closer to the power strip if you can; otherwise, use the extension cord to move the power strip closer to the table.
3. Decide the location of the study scene so that the webcams get the most private view of the child's face and the study scene (i.e., the computer station, you, and passersby shouldn't appear in the camera's view). The webcams should also be easy to reach so you can easily adjust the angle at the start of each session.
4. On the power strip, these should be connected:
    a. Router
    b. Tega charger connected to extra robot
    c. USB charger for the tablet (connect to tablet until study starts and put tablet there in between kids if there is extra time)
    d. Samsung S7 fast charger (connected to the extra robot phone)
    
    e. Your laptop charger
5. Always keep one S7 phone charging with the S7 charger. At the start of the day, charge the phone with the least amount of battery.
6. Connect ethernet cables from the router to the mac mini and from the router to your laptop *before you power the mac mini on.*

Table setup

1. Put Tega's fur on if it is not wearing fur yet. We always use red fur!
2. Check Tega's forehead camera: Is the camera cable on the right of the camera securely connected?
3. Place Tega and the tablet on the tablet stand as shown in Figure 2.
4. Tablet **must** be placed stageright of Tega (on the left if you are facing Tega)! There are presets for where Tega looks that assume the tablet will be on that side.

5. In **sessions 1**, **4, 5, and 8** place the tablet vertically. In **sessions 2**, **3, 6, and 7** place the tablet horizontally.
6. Set one of the extra robot phones on the edge of the table, near the child so it will pick up their speech. Plug this phone in to power if possible!

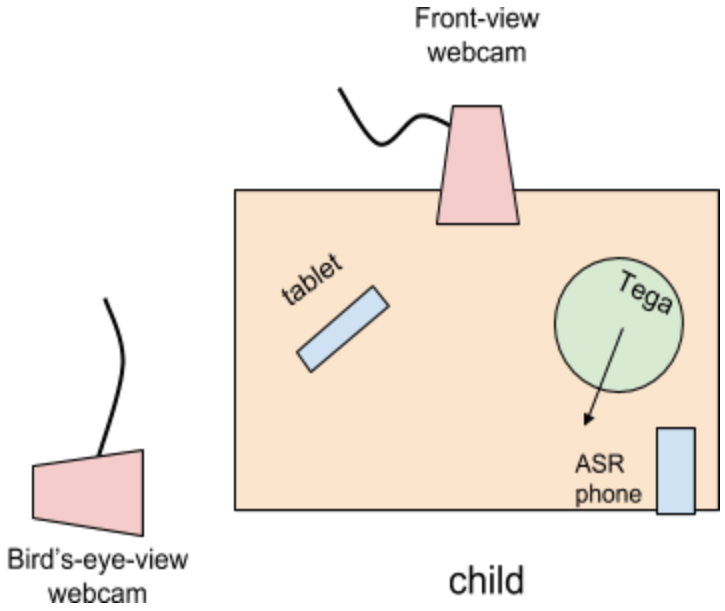


Figure 2: Study table setup & Webcam locations. The Front-view webcam can be on the little tripod on the table and the Birds-eye-view webcam can be on the big tripod nearby.

Computer setup

1. Check that the router is plugged in and turned on. It should have blinky lights.
2. Plug your laptop into power.
3. Plug the mac mini into power.
4. Turn on the mac mini by pressing the on button until you hear it make its "on" noise.
5. Network: Connect your Mac to the router's network. The name will be either "prg-mifi-1" or "prg-mifi-3". Password: kronik420
6. Look at the mac mini. Is it labeled "robots1" or "robots2"?
7. Open a terminal. You will ssh into the mac mini: `$ ssh -Y robots@robots1.local` OR `$ ssh -Y robots@robots2.local`
    a. Password: robots
    b. You will need a couple terminals on the mac mini, so open two more tabs and run the same ssh command in those so you have multiple terminals open to the mac mini.
    c. If the ssh command does not work, wait a moment and try again in case the mac mini had not finished booting yet.
8. Type `$ echo $ROS_IP` or `$ ifconfig` to see the machine's IP address. You will need to enter this IP address on the Tega phone and on the tablet later.

Webcam setup

1. It's very important to position the webcams right!
2. It's best not to use any extension cords, but there are USB extension cords if you need them.
3. **Front-view webcam:** Put on the smaller tripod and place on the table between Tega and the tablet.
4. **Bird's-eye-view (side view) webcam:** Put on the larger tripod to capture the overall study scene.
5. Connect both webcams DIRECTLY to the computer's USB ports. Do not use a USB hub.

6. **Open Photo Booth** and check the views of the two webcams and adjust them appropriately (change cameras in the “Camera” menu). See example good views below.
7. Quit Photo Booth (command-q).

	
Front view good example: The child’s face is in the center of the webcam view, and it captures the front of the child's face.	**Front view bad example**: The webcam is capturing the side view of the child, and the top of the head is cut off.

	
Side view good example	**Side view good example**

Start Stuff! (on the mac mini via ssh)

In your ssh terminal window:

1. Run `$ roslaunch rr_interaction rr_dependencies.launch`
2. Start the robot:
    a. Turn on the robot: button is under the robot's base. Green LED will turn on when the robot is on!
    b. Check that the phone is connected to the right wifi network ()
    c. Open the Tega app.
    d. Check that the IP on the bottom matches the IP address of the mac mini.
        i. You can type `$ echo $ROS_IP` or `$ ifconfig` in your ssh terminal window to see the mac mini's IP address.

e. Check that the Tega number in the top right matches the number on Tega's face (below the mask/fur, top right of the phone holder).
f. Press "ROSTegaController"
g. Wait
h. Poke the robot's face to activate it

3. Start the tablet:
    a. Check that the tablet is connected to the right wifi network ()
    b. Open the Opal app (blue circle icon).
    c. Enter the IP address of the mac mini.
        i. You can type $ echo $ROS_IP or $ ifconfig in your ssh terminal window to see the mac mini's IP address.
    d. Hold the input field with the fingers on one hand, and enter text on the onscreen keyboard with the other. There's a bug in how the input fields get focus, such that they lose focus when you move your finger and then the keyboard goes away... it's weird and annoying, but there were more important things to fix.
4. Start the offline ASR app on the extra robot phone sitting on the table:
    a. Check that the phone is connected to the right wifi network ()
    b. Open the Offline ROS ASR app (little dots icon).
    c. Enter the IP address of the mac mini where it says "localhost". It should look like "http://192.168.1.140:11311" (but with the correct IP address).
        i. You can type $ echo $ROS_IP or $ ifconfig in your ssh terminal window to see the mac mini's IP address.
    d. Test that it the app is recognizing speech by touching the checkbox and then saying something. You'll see the progress bar turn blue as the app tries to recognize your speech. It should print what you say on the screen.
5. In your next ssh terminal tab, type $ cd ~/projects/ros_catkin_ws/src/rr_interaction/
    a. You will use this tab later to type $ python launch_interaction.py to start the interaction for the next participant.
6. When the tablet and Tega are both on and connected, you should see the following rostopic list:

```
$ rostopic list
/USBCam_image/compressed
/affdex_data
/android_audio
/asr_command
/asr_result
/audio_request
/msg_bc
/msg_os
/msg_pitch
/msg_sb/normalized
/msg_sb/raw
/rosout
/rosout_agg
/rr/audio_entrainer
/rr/entrain_audio
/rr/entrainment_data
/rr/opal_action
/rr/opal_command
/rr/state
```

/rr/user_input /tega /tega_state /tegacam/compressed/parameter_descriptions /tegacam/compressed/parameter_updates
$ rosnode list /BackChannel /SpeakingBinary /google_asr_node /opensmile_node /r1d1_tega_robot /record_1519676508564303897 *(or some other number - this is the rosbag recording!)* /relational_robot /rosapi /rosbridge_websocket /rosout /rr_audio_entrainer /rr_lookat_and_affect_node /rr_user_input_form /tegacam

Troubleshooting

Network issues

- Speech recognition doesn't work.
- Tega camera frame rate seems low (delayed).
- Tega doesn't go to sleep when you tell it to, but rostopic echo /tega_state outputs messages.
    1. Check that all the ethernet cables are plugged in.
    2. Restart the offline ASR app.
    3. Restart the phone that runs the offline ASR app.
    4. Restart the router.
    5. Restart your laptop.

Offline ASR app quits unexpectedly.

1. Sometimes it does that. Re-open the app.
2. Check the IP address.
3. Start it running again.

Can't ssh into the mac mini

1. Check the number in the ssh command: robots1 or robots2?
2. Check that the ethernet cable to the router is plugged in.
3. Check that you typed the password correctly
4. Check that the mac mini is turned on (red led will be visible if you look at the side with the ports, you may be able to hear its fan whirring quietly).

Tega Cam view doesn't show anything

1. rostopic echo /tega_state outputs messages
    a. Take off Tega's mask. Check that the camera cable on the right side of Tega's forehead camera is connected.
    b. Restart Tega app.
2. rostopic echo /tega_state doesn't output messages
    a. Tega is probably not connected. Make sure Tega phone is on the right network, and restart Tega app with the correct ROS_IP address.

Roscore shuts down saying "unable to contact my own server at [http://192.168...."

1. Type $ echo $ROS_IP then $ ifconfig and compare the IP addresses listed by each. If they are different, try:
2. $ source ~/.bashrc

CHEATSHEET

1. **On mac: Start camera recording: (follow the prompts!)**
2. **In ssh window on mac mini: roslaunch rr_interaction rr_dependencies.launch**
3. **Start robot - check IP and Tega number!**
4. **Start Opal tablet - enter PID and IP!**
    a. Hold the input field with the fingers on one hand, and enter text on the onscreen keyboard with the other. There's a bug in how the input fields get focus, such that they lose focus when you move your finger and then the keyboard goes away... it's weird and annoying, yeah, but there were more important things to fix.
5. **In ssh window on mac mini: cd ~/projects/ros_catkin_ws/src/rr_interaction/**
6. **In ssh window on mac mini (when you know the next participant): python launch_interaction.py (follow the prompts!)**