Within this folder are the example schedules used in our lab for pre-training.

General training:

Note: these schedules require an image library. These images should be indexed in image lists. If no images are available (they can come with ABET software or be customized), email astolyarova@psych.ucla.edu

These schedules are modifications to initial training phases common to a variety of different tasks (including discrimination and reversal learning, delay-based tasks, as well as perceptual decision making paradigms). Brief descriptions as well as the most critical changes made to earlier versions of ABET schedules are outlined below:

1. The first phase in all pre-training is **Habituation**. This schedule automatically delivers 5 sugar pellets into the magazine. If more pellets are needed, modify the last line in Step 1: Set **Pulse Count** to the desired amount of sugar pellets to be delivered at the beginning of the run. This schedule keeps track of elapsed time, reward beam breaks, and screen touches. Recommended run time is 15 minutes.
   - To ensure that the rats consume all available sugar pellets quickly, familiarize them with the reward in home cages for 2 days prior to initial exposure to testing boxes (~20 pellets per day).

2. The next training phase is **Initial Touch to Center**. Here, rats are trained to nose-poke a visual stimulus presented in the center of the touchscreen. In subsequent phases, touches to this stimulus will be used for trial initiation. The recommended run time is 45-60min per day. The uploaded version of the schedule delivers one sugar pellet if a rat touches the stimulus presented in the center of the touchscreen within 40s. To change this time interval, modify the **initiation_time** variable. Sometimes, it helps if the rats are initially given 3 sugar pellets for each correct touch instead of 1 sugar pellet. To change this, modify the first line in step 3 of the schedule. As in **Habituation**, **Pulse Count** can be set to any desired amount of sugar pellets delivered per trial. When a rat collects the reward (or if 40s pass without a response), the ITI will begin before the next trial is available. The ITI time is currently set to 10s. To change this, modify the **ITI** variable in the left panel.

   - In earlier versions of ABET protocols, rats were reinforced with 3 sugar pellets if they nose-poked the stimulus, or with 1 sugar pellet if the maximal time (40s) has elapsed. We have found that making the rewards available for free encourages rats to spend more time by the magazine, and it takes longer for them to learn to interact with the touchscreen during subsequent stages.

3. The final common stage in pre-training for all tasks is **Immediate Reward** (or *initiation followed by a second response* training). In this phase, a rat is first required to initiate a trial by nose-poking at the center of the screen. Then, an image will appear either on the left or right (only one image appears per trial). If

the rat nose-pokes the second image, it will be reinforced with one sugar pellet immediately. If the rats should be reinforced after a delay, modify the **delay_to_reward** variable in Step 6 (*image touched*), any value can be entered after '='. In the current version, a rat is given 40s to initiate the trial (nose-poke the first image) and 40s to respond to the second image. To modify these times, change the **initiation_time** and **Choice_time** variables in the left panel. The ITI variable can be similarly modified. If additional reinforcing events are needed, such as sound/tone presentation after a correct response or house light after an incorrect response, those commands can be entered into Step 6. However, we have found that these phases of pre-training can be completed within 1-2 sessions without additional cues.

- Earlier versions of ABET schedules required rats to initiate a trial by entering the magazine. We have found that trial initiation by nose-poke at the screen keeps rats more engaged with the task and reduces the number of choice omissions.

We have found that these 3 pre-training phases are sufficient to prepare the rats for a variety of different tasks. The recommended sequence is as outlined before: 1) **Habituation** for one testing session. 2) We recommend using two versions of the **Initial Touch to Center** training. During the first step, rats can be reinforced with 3 sugar pellets for each correct touch to the center of the screen. During the second phase, the reward magnitude can be decreased to 1 sugar pellet. Completion of each phase should take 1-3 days if the criterion is set to 60 responses within 45-60 min sessions. 3) **Immediate Reward Training** should take 1-3 days with the same criterion.

Another recommendation is to test rats 5-6 days per week as we have found that giving animals at least one day off promotes faster task acquisition. Once the animals have completed these pre-training schedules, they are ready to move to a specific task, where 2 or more options are available to choose from after trial initiation. Note that some, more complex, testing paradigms may require additional training phases introduced after the ones described here.

For clarifications or modifications please contact Alex (astolyarova@psych.ucla.edu). Similarly, email for customized training and testing schedules for specific tasks.