AuDrA Tutorial

This tutorial covers how to set up and use a local Python version of AuDrA to quickly get creativity ratings for drawings from the Multi-Trial Creative Ideation paradigm ("incomplete shapes" task, Barbot, 2018). AuDrA is not extremely resource hungry, but it is suggested to have either: (1) 4 CPU cores and 8GB of RAM or (2) a recent NVIDIA GPU (fewer than 7 years old). GPU computation is faster but, for most practical applications (i.e., fewer than 1000 drawings), the difference will be minimal. A troubleshooting section is included at the bottom of the tutorial.

PART 1: DOWNLOAD THE AuDrA DIRECTORY

- Download the AuDrA folder and put it on your machine somewhere at the *user* level.

PART 2: INSTALL MINICONDA AND CLONE ONE OF THE AuDrA VIRTUAL ENVIRONMENTS

- Miniconda is a Python manager for virtual environments and packages. Install Miniconda for your appropriate system using this link. Be sure to install it at the *user* (not system) level on your machine if using a university computer.

- Once downloaded, open Terminal (Mac/Unix) or Command Prompt (Windows). Navigate to the AuDrA folder in your terminal by typing 'cd' followed by a single space and then dragging and dropping the 'AuDrA' folder from your file explorer into the command line. A file path should now be visible in the terminal. Then hit Enter and you will be in the 'AuDrA' directory. If this does not work, see the troubleshooting section.

- If you intend to get ratings via the CPU (most people), type `conda env create -f audra_environment_cpu.yml` in your terminal and hit Enter to clone the AuDrA virtual environment. Alternatively, if you intend to get ratings via the GPU, type `conda env create -f audra_environment_gpu.yml` and hit Enter. This will create a virtual environment called 'audra_cpu/gpu', depending on which environment you set up. It will also install python and all required packages. Leave this terminal open (in the AuDrA directory), as we'll use it in the next part.

PART 3: RUN AuDrA

- Add drawings from the Multi-Trial Creative Ideation paradigm ("incomplete shapes" task; Barbot, 2018) to the 'user_images' folder, inside the AuDrA directory. Be sure to remove the example images beforehand. If you wish to name the output file something particular (e.g., 'study1_audra_ratings.csv', open AuDrA.py with a text editor of your choice and edit the 'output_filename' variable in the USER EDIT section to reflect the desired output name. If unchanged, AuDrA will output a file named 'AuDrA_predictions.csv'. **Note**: do not set 'output_filename' to the name of another .csv you have in the AuDrA directory, as it will overwrite the older one.

- Once you've named your output file, activate the 'AuDrA' virtual environment from the terminal by typing `conda activate audra_x`, where x is equal to cpu or gpu, depending on which variant you installed. Hit Enter. You should now see '(audra_x)' prepended to the command line.

- Finally, run the AuDrA Python script by typing `python AuDrA_run.py` into your terminal and hitting Enter. This may take a moment, depending on your hardware specifications and the number of drawings you've included in the 'user_images' folder, but is unlikely to take longer than 30 seconds. The output file will contain two columns: one named 'filenames,' which corresponds

to the filenames of the images included in the 'user_images' folder, and one named 'predictions' that corresponds to AuDrA's creativity predictions. Note: AuDrA's predictions are in minmax normalized (i.e., 0-1) Judge Response Theory theta values (Myszkowski, 2019).

TROUBLESHOOTING

- ***Navigation to the AuDrA folder via the command line (PART 2, 2nd bullet)***
  - If your machine does not let you change to the AuDrA directory in the terminal, or if the terminal prints 'access denied', security/permissions are likely the problem.

    - If on a personal computer:
      - Mac/Unix: Permissions issues are unlikely to affect this part for these users.
      - Windows: Try opening Command Prompt as an administrator by right clicking the Command Prompt app in the search menu and selecting 'Run as Administrator'. Then, try changing directories again. If this does not work, try the instructions below for university computers.

    - If on a university computer:
      - Mac/Unix: Ensure the AuDrA folder is saved at the user and not system level (e.g., Documents folder). If this does not work, you will need to request administrator rights to your computer from your university's IT services.
      - Windows: First, ensure the AuDrA folder is saved in a place you have permissions to at the user (not system) level and in a drive you have access to (likely the C: drive). From the Windows start menu, scroll down until you find the Anaconda or Miniconda folder. Click the dropdown arrow and open 'Anaconda Powershell Prompt (miniconda3)'. Try using this terminal to complete PART 2 (2nd bullet). If this does not work, you will need to request enhanced permissions or administrator rights to your machine from your university's IT services.

- ***Cloning or activating the AuDrA virtual environment (PART 2.3 or PART 3.3)***
  - If on a personal computer:
    - Mac/Unix: If an error occurs, try running the conda command as root—i.e., 'sudo conda env create -f audra_environment_x.yml', where x is either 'cpu' or 'gpu'. It will ask you for your computer's password.
    - Windows: If an error occurs, try opening Command Prompt as an administrator (right click the Command Prompt app in the Windows start menu and select 'Run as Administrator') and running the conda command again.

  - If on a university computer:
    - Unix & Windows: Ensure you downloaded miniconda at the user, rather than system, level. If not, uninstall and reinstall at the user level and in a location/drive your user account has access to. If this does not work, you will need to request enhanced permissions or administrative rights for your computer from the university's IT services.

- ***Running AuDrA_run.py (PART 3)***

  - If running 'python AuDrA_run.py' at the command line results in a Permission denied error:
    - Personal computer: Run the script with enhanced permissions. On Mac/Unix, enter the command 'sudo python AuDrA_run.py' and enter your computer's password. On

Windows, open a Command Prompt as an administrator by right clicking the Command Prompt app in the Windows start menu and clicking ‘Run as administrator’.

- University computer: Enhanced permissions and/or administrative rights to your machine are needed; reach out to your university’s IT services to request this.