Introduction to BayesACT Simulator v0.2

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Features of the BayesACT Simulator, in development:

- User-friendly, point-and-click interface for simulating social events with BayesACT models
- Flexible design allows users to simulate event scenarios with a wide range of characteristics
    - Specify multiple identities (and their relative probabilities) for each agent
    - Model one agent's interpretation of events or both agents' interpretations at once
    - Agents can communicate emotions without acting, act without communicating emotions, or emote and behave simultaneously
- Modifiable parameters allow for adjustments to model specifications, e.g., altering agents' level of uncertainty, or the degree of adherence to the affect control principle
- Offers interactive 3D visualization of cultural dictionaries and simulation output
- Works on any platform, without the need to install additional software

Background:

In developing the current version of the software, we have focused on the user experience in running simulations and interacting with the output. Many of the screens and functions that the final software will contain are not yet included. You will ultimately be able to import your own dictionary data, and review and compare these data in list view and using an interactive 3D interface. You will also be able to define your own interactants and manipulate more BayesACT parameters and settings.

The normal sequence for simulating events with the software is to set the model parameters, define the interactants, then simulate events and view your results. For today's demo, we'll be focusing on a few example simulations that will help you get familiar with the interface. These can be initialized from a demo file included with the software.

Instructions:

- Download the software, making sure to choose the appropriate version for your operating system. Unzip the file, open the folder, and launch the file named **BayesACT Simulator v0.2**. Select your preferred screen resolution, then click **Play!**
- At the top of your screen is a navigation menu with three options: **Import/Export Dictionaries**, **Explore Data**, and **Simulate**. You will find yourself on the **Import/Export Dictionaries** screen by default. This screen has no content in the current version of the software. The second menu option, **Explore Data**, is also empty. For our demo today, will be focusing on event simulations with BayesACT. Click on the **Simulate** menu to proceed.
- There are three additional options in this menu: **Set Parameters**, **Define Interactants**, and **Simulate Events**. You will find yourself on the **Set Parameters** screen by default.

Set Parameters

- This screen allows you to set some of the BayesACT model parameters that will be used in your simulations. In the current version of the software, there are three types of parameters you can adjust. You can also choose to accept the default values that are predefined for you.

    - **Number of Samples** – the number of samples to be used in the simulation. If you select a large number of samples or have a slow machine, running each simulation will take longer.
    - **Alpha** – values that govern the strength of the affect control principle as it applies to agent, behavior, or client. In other words, how much do I believe that people are going to act according to cultural prescriptions? This value should be small if we expect the affect control principle to be weak, and large if we expect it to be strong.
    - **Beta** – values that govern how much variability we expect in the identities associated with the agent and client. In other words, how much do I believe that connotative meanings for the identities involved in the interaction are going to stay the same over time? This value should be small if we don't expect identities to change much, and large if we expect them to change a lot.
- Once you have finished adjusting the model parameters, navigate to the **Define Interactants** screen.

Define Interactants

- Click **Initialize Simulation from File**, then choose the appropriate demo file (see **Examples** at the end of this document for more info).
    - For the time being, you will need to close the software and start over if you want to initialize a new simulation from a different file. If you want to try out different simulations using this iteration of the software, you can modify one of the demo files provided, using its contents as a template.
- Once you have selected a demo file, navigate to the **Simulate Events** screen. You will find yourself in the **Current Situation** tab by default. Stay on this tab for the time being.

Simulate Events: Current Situation

- To begin, select a dyad from the **Interactants** menu on the right-hand side of your screen. The names in this menu refer to the different pairs of agents and clients whose identities have been pre-defined for you in the demo file (see **Examples** at the end of this document for more info).
- By selecting names in the **Viewer** and **Viewing** menus, you can get a sense of how different agents are currently seeing themselves, other persons, and possible lines of action. Click on the **Emotion, Identity,** and **Behavior** buttons to review a list of the most probable emotions, identities, and behaviors associated with a given agent, from some agent's point of view.
- The results are sorted from most to least probable (the first number). The EPA value of each concept is also provided (the three numbers that follow are evaluation, potency, activity).
- As you simulate interactions, you can review information about deflection at the bottom of the **Current Situation** screen.
- The plot to the left will visualize whatever you have selected in the right panes.
    - You can snap to a 2D view with any orientation by clicking the **EPA**, **AEP**, or **PAE** button; the order of the letters refers to the X, Y, and Z axis, in that order. For an interactive 3D view, click anywhere on the plot and drag to shift your perspective.
    - Clicking the **Dict.** button will plot in-range values from the dictionary alongside the BayesACT-predicted values. Click on the dictionary data points (red cubes) to see the associated label and mean EPA value.
    - You can choose to view either fundamental or transient sentiments by checking the **F** or **T** box below the plot. The **Jiggle** button will make the points move a bit, so you can see points that overlap in the plot.

- Points from the left and right columns will be plotted in different colors. These colors can be specified using the drop-down menus in each column.

Simulate Events: Next Situation

- When you are finished reviewing the current situation and ready to specify the next event, click over to the **Next Situation** tab. Here, you can select the next action and/or emotion for each interactant and simulate the next event.
- The table at bottom right of your screen shows the actions and emotions that have been specified for the next step of the simulation. This table is automatically populated with the most probable values from the previous simulation, but you can make changes.
- Select a name in the **Viewer** menu to indicate whose POV you are defining, then use the **Viewing** menu to specify who they are viewing.
- Select **Emotions** or **Behaviors** from the **View** choices, then choose the emotion signal you wish for the **Viewer** to send, and/or the action you wish for them to perform; the table will change to reflect your choice.
- You can select "NOT OBSERVED" in the **Emotions** viewer and/or "NOT ACT" in the **Behavior** viewer to indicate that a particular agent does not express emotion or act from someone's POV – but at least one person must act to proceed.
- You may choose to define only one person's view of the situation (as in Program Interact), or to simulate both persons' views simultaneously.
    - If you wish to define only one person's view of the situation, check the box next to that person's name (e.g., "Simulate Sally") and uncheck the box next to the other person's name. This will automatically populate the unchecked person's views of emotion and behavior with "NOT OBSERVED" and "NOT ACT".
    - To simulate both persons' views simultaneously, keep both boxes checked, and specify each agent's views of self and other. You can specify behaviors *and* emotions if you wish (e.g., Dave is happy, and congratulates Tom), but you can also choose just one or the other (e.g., Tom is sad, but doesn't act; Sally hugs Tom, but shows no emotion).
- When you are ready to proceed, click the **Run** button. Once you do, you will automatically be returned to the **Current Situation** page, where you can review the results. You can iterate through this process as many times as you wish to simulate an unfolding interaction.

Examples

Example 1: **testsim-interact.txt**

Tom and Hank agree that Tom is a boss and Hank is a secretary.

```
interaction: hank : tom
hank : secretary : 1.0
tom : boss : 1.0
endinteraction
```

```
interaction:  tom: hank
tom : boss: 1.0
hank : secretary : 1.0
endinteraction
```

Example 2: **testsim-sb1.txt**

Tom and Hank disagree about the definition of the situation. Hank sees himself as a secretary, but sees Tom primarily as a jerk, but somewhat as his boss. Tom sees himself as a boss, but sees Hank equally as his secretary and a lackey.

```
interaction: hank : tom
hank : secretary : 1.0
tom : boss : 0.3 : jerk : 0.7
endinteraction
```

```
interaction:  tom: hank
tom : boss: 1.0
hank : secretary : 0.5 : lackey : 0.5
endinteraction
```

Example 3: **testsim2.txt**

Dave sees himself mostly as a hero and a husband, but also as a father. He does not know Tom, so his beliefs about Tom's identity are modeled as an even distribution over all the identities in the dictionary.

```
interaction: dave: tom
// daves generic identity
dave : hero : 0.5 : husband : 0.4 : father : 0.1
// dave doesn't know tom
tom :
endinteraction
```