The Faces of Microbial Communities

Thomas Albertine, Michael Phelps

**Abstract**

Currently, microbiologists use charts and distance matrices to analyze populations of microorganisms in a sample. This method is difficult and unintuitive.

We improve on this process by leveraging the brain’s ability to recognize subtle differences in human faces. The project generates human faces based on microbial community data and presents them to users, allowing them to easily find patterns and differences.

**Problem Definition**

The current tools used by microbiologists, such as pie charts, stacked bar charts, and difference matrices, are unintuitive, which inhibits their ability to help users detect relevant patterns in microbial population data.

**Proposed Solution**

We would to create a tool that generates 3D models of human faces based on the sample data. To do this, we intend to convert the sample data into parameters that we can pass to the MakeHuman Python API, in which the actual model generation takes place. Finally, the tool will display the 3D models representing the samples on the screen, so the user can make comparisons.

**Performance Metrics**

Goals

* Can we load a data file?
* Can we generate a model based on that data?
* Can we present the generated models to the user?

Stretch Goals

* Have we discovered, using this tool, something that would otherwise be missed?
* Has our tool enjoyed widespread adoption by researchers in the field of microbiology?
* Can our tool be used with other kinds of data sets?