MICROBIAL FACIAL VISUALIZATIONS

The Many Faces of Microbial Communities

Approach Taken

Using the open source software MakeHuman, we can generate various faces based on numerical parameters.

- Load supported file formats (QIIME OTU)
- Convert file format to parameters for MakeHuman API
- Generate models as Wavefront .obj files
- Present models to user using Qt UI framework

Logos of software used in project

Technologies Used

- MakeHuman (open source 3D model generation software)
- Python 2.6 (general purpose programming language)
- Qt (cross platform gui toolkit)
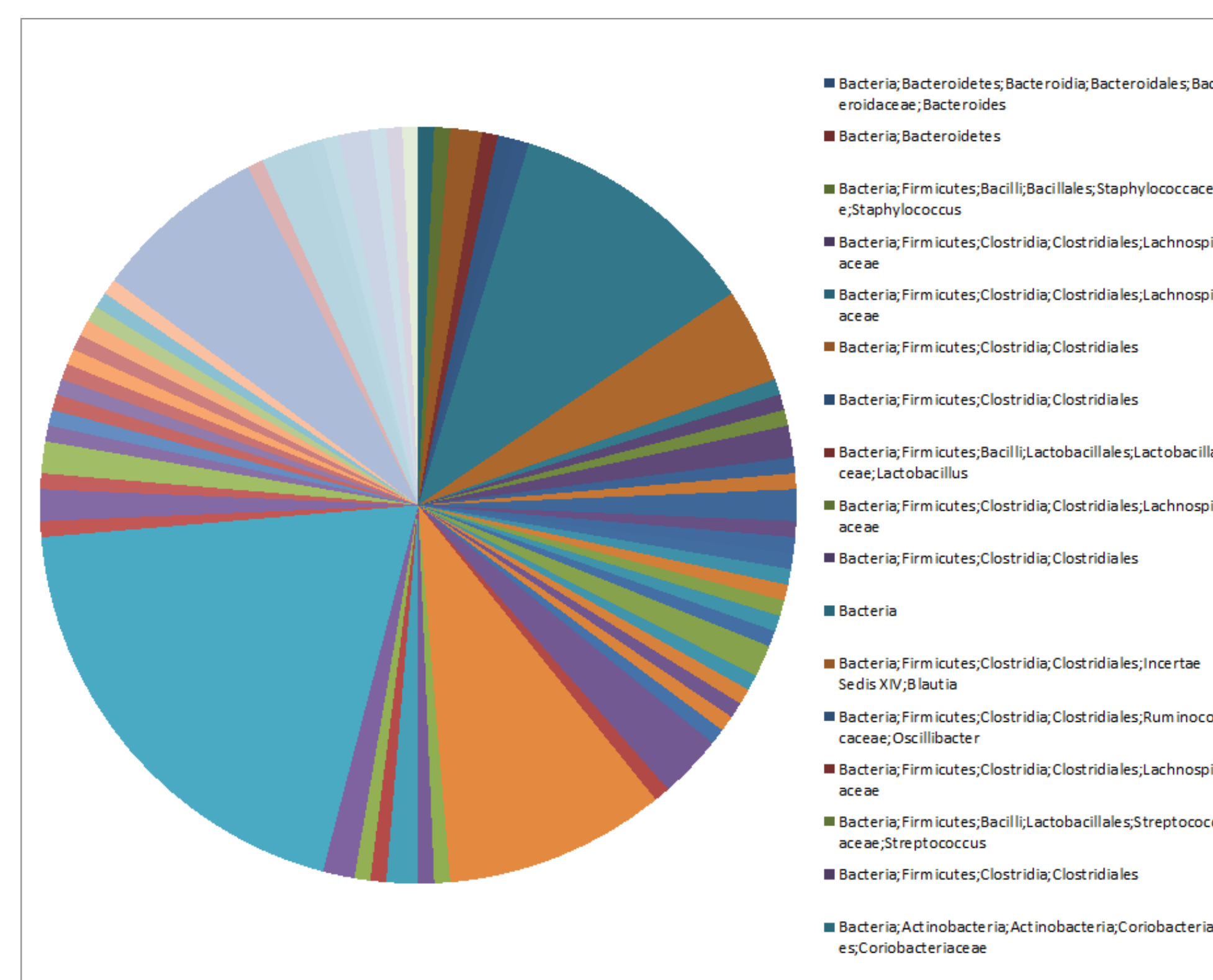- Wavefront .obj (geometry definition file format)

Problem Description

Current visualization technologies for population data is unintuitive when attempting to find patterns between samples.

- Makes scientists jobs more difficult
- Bar charts and pie charts do not lend themselves to easy comparison for large data sets

A bar chart of sample microbial data

Proposed Solution

- The human brain has a special section just for recognizing faces
- We can harness this by generating faces that represent sample data
- This allows scientists to find patterns by recognizing them in facial features
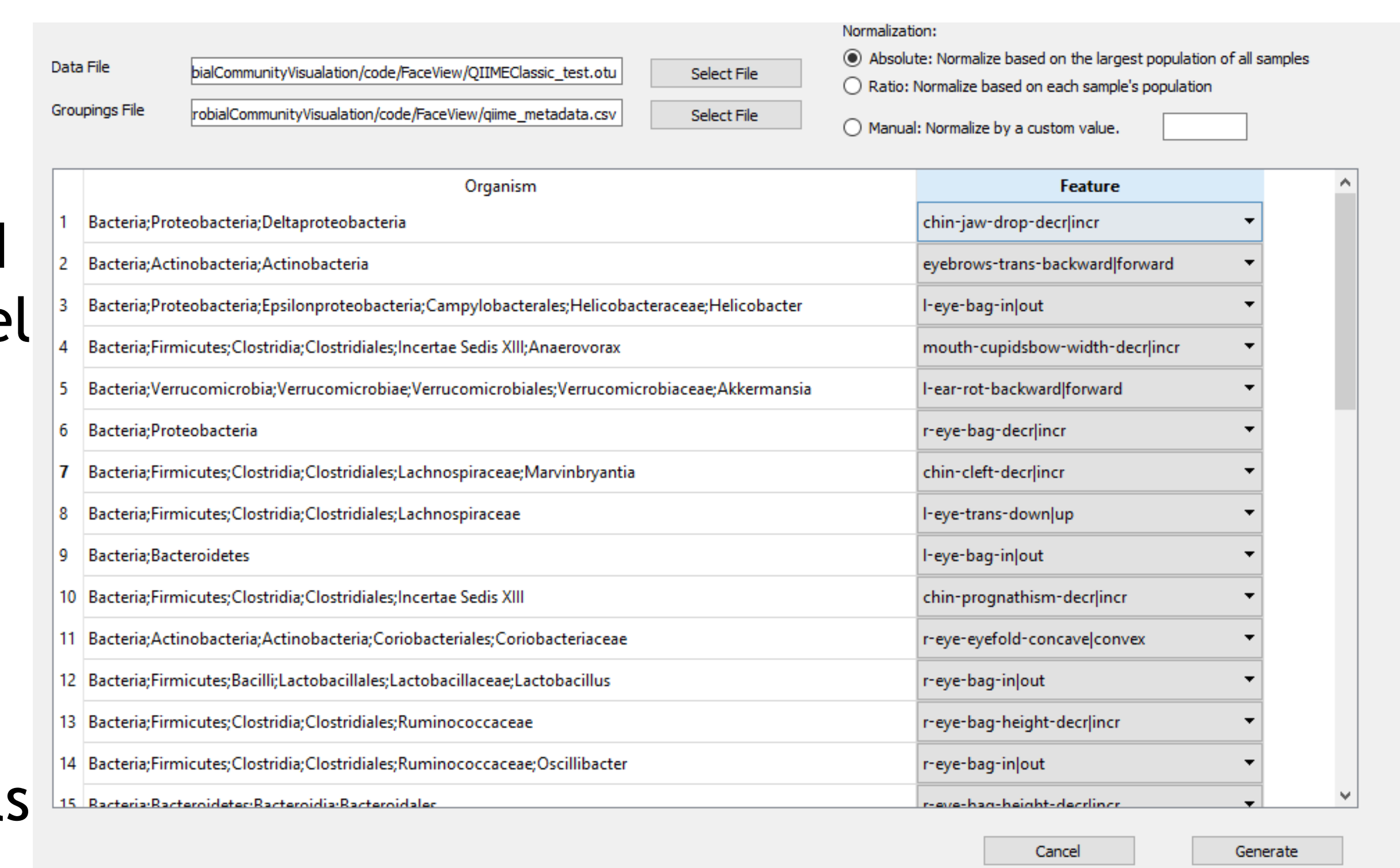- This could potentially open up breakthroughs in microbiology
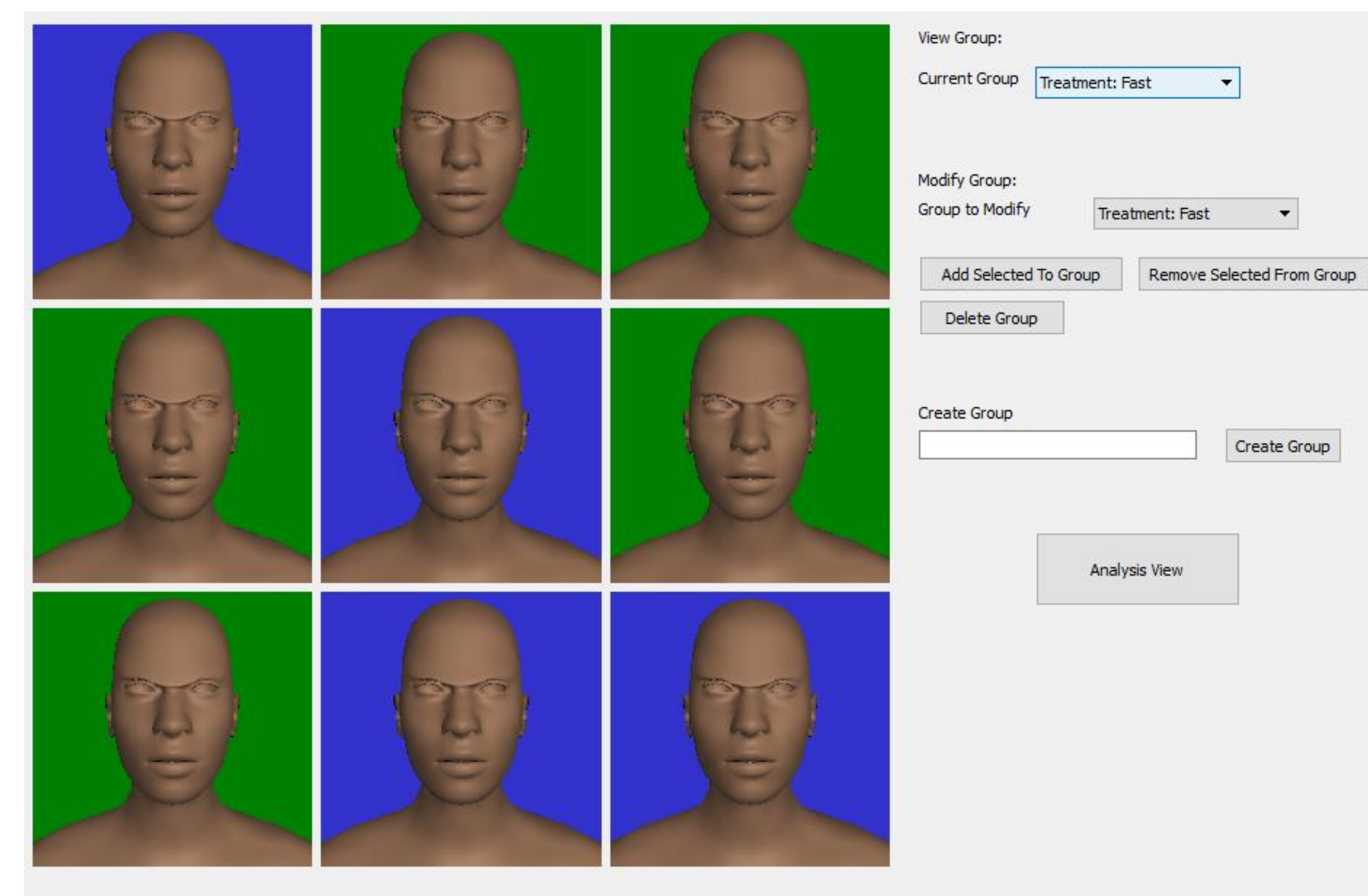
Models generated from sample microbial data

Features

Additional features have been included to allow for easy use and optimal model generation.

- Model generation parameterization
- Sample grouping based on metadata
- QIIME OTU format support
- Rotate, pan, and zoom around models

Selection and grouping tools for larger data sets

PROJECT TEAM #36

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Results and Recommendations

- Hopefully:

Scientists were able to use our faces to make distinctions between microbial samples.

- Hopefully:

Scientists were able to use our software to come to a scientific breakthrough.

- Hopefully:

Our software helps normal people better understand the diversity of microbial communities

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