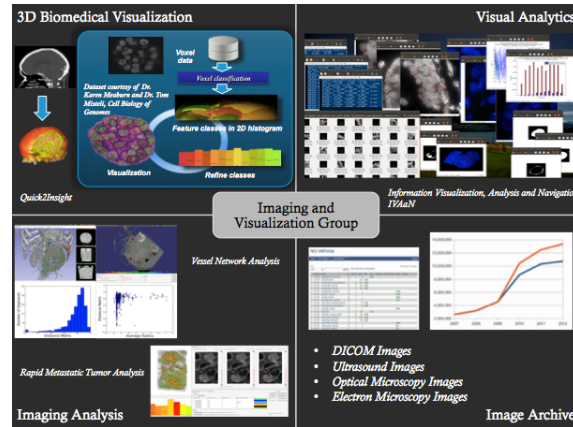


The Team

- ◆ Works with NCI/FNLCR imaging facilities and investigators
- ◆ Gathers user requirement from domain experts in imaging facilities
- ◆ Collaborates with external imaging communities
- ◆ Adopts new technologies in image analysis and visualization
- ◆ Performs technology development
- ◆ Builds workflows to increase image analysis throughput
- ◆ Develop and maintenances computing infrastructure for image analysis – including common software tool sets, thin clients, and servers



Imaging and Visualization Group

Advanced Biomedical Computing Center

Information Systems Program

Frederick National Laboratory
for Cancer Research

yanling.liu@fnlcr.nih.gov
301-846-7366

<http://ncifrederick.cancer.gov/isp/abcc>

ABCC Imaging and Visualization Group ISP, FNLCR

- 3D Biomedical Visualization
- Quantitative Image Analysis
- Information Visualization
- Image Archive
- Nano-Structural Support



IVG

Information Visualization and Visual Analytics in Biomedical Research

IVG focuses on providing efficient collaborative open access to large-scale heterogeneous biomedical datasets.

Utilizing Html 5, d3.js, and other web-based technologies, IVG develops web applications allowing users to browse, select, compare, and visualize biomedical data stored on remote server.

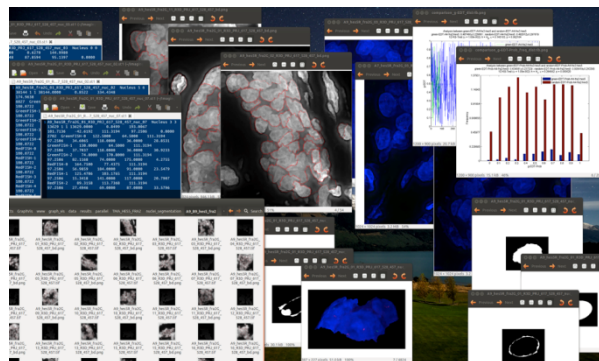
Based on NoSQL database MongoDB, IVG develops workflows and web applications allowing user to save analysis process for future review and/or collaborative sharing with other colleagues.

By continuously exploring new technologies, IVG is able to quickly prototype workflows and web applications in order to meet the evolving and changing biomedical data analysis needs.

Integrated Visualization, Analysis, and Navigation (IVAaN)

The IVG develops Integrated Visualization, Analysis, and Navigation (IVAaN) framework to provide support in information visualization and visual analytics for biomedical research.

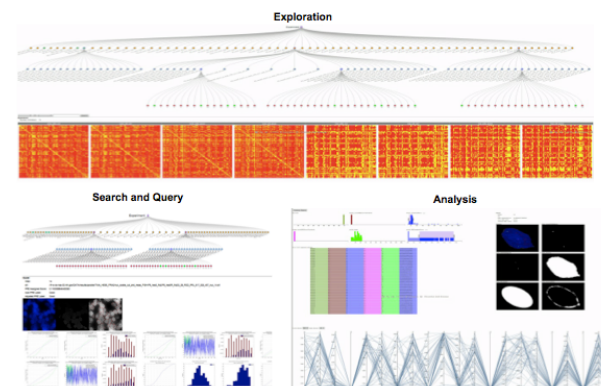
In recent collaboration with the Optical Microscopy Analysis Laboratory, the IVG utilized developed IVAaN framework to convert a 35GB heterogeneous microscopy experiment dataset to an interactive web application for effective navigation, visualization and analysis.



Snapshot of the 35GB dataset

The image above shows a snapshot of the dataset. The dataset includes approximately 74,000 files and folders, including images in different formats, spread sheets, text files, and other binary format data files. Manual navigation in such complex dataset is difficult due to the tedious file browsing and crowded display space showing data files in a traditional windows based way.

Integrating NoSQL database MongoDB, d3.js JavaScript visualization library, and other open source software libraries and tools, the IVG created an interactive web application for quick data navigation, search, and multi-dimensional data analysis. Snapshot of the app is shown to the right.



Snapshot of the IVG developed web app

Analyzing TCGA Meta-data

The hierarchical data set visualization and analysis workflow in the IVG IVAaN framework allows user to view ~8000 TCGA XML files in a tree structure.

Users can select subset to create a keyword view and be able to see unique values connected to the selected keyword. Then a subset of XML files can be selected from the selected keyword-value pair for quick narrow down the scope for examination. User selections of XML files, keyword, and values can be saved for future view.

