Breakout Session 1: Track B

MultiViewPortal: Towards a Scalable Web Application for Multiview Learning

Dr. Sandra Safo
Assistant Professor, University of Minnesota

MultiViewPortal
Towards a Scalable Web Application for Multiview Learning

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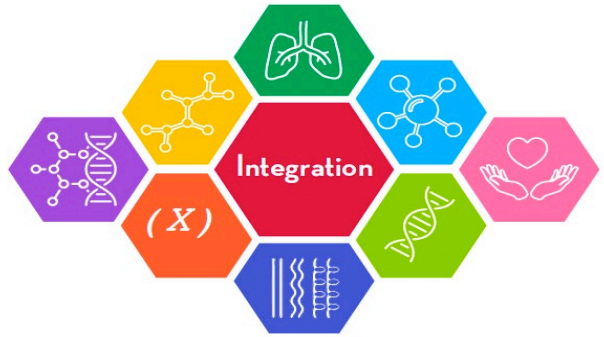
Division of Biostatistics and Health Data Science



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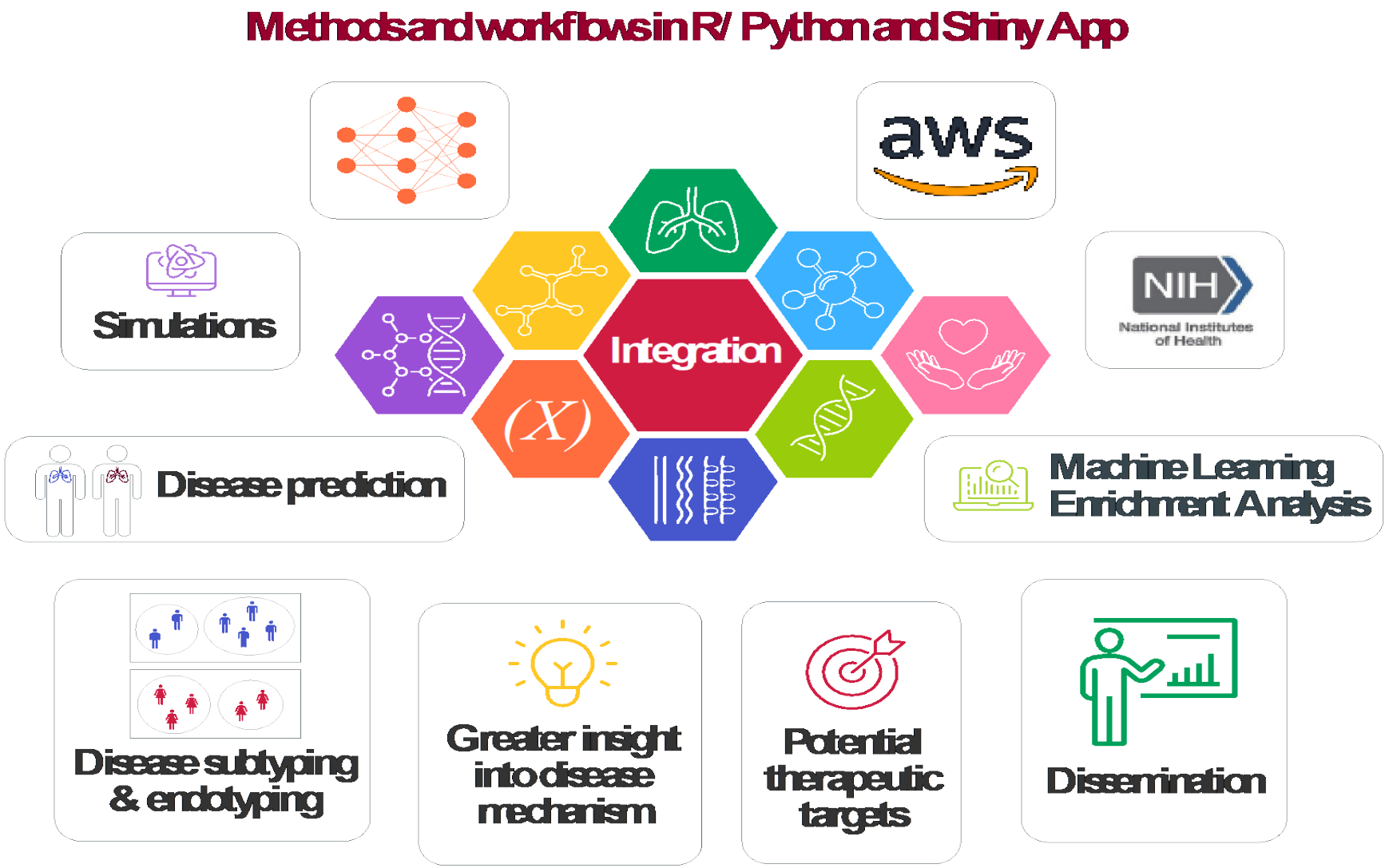
Our Vision for MultiViewPortal

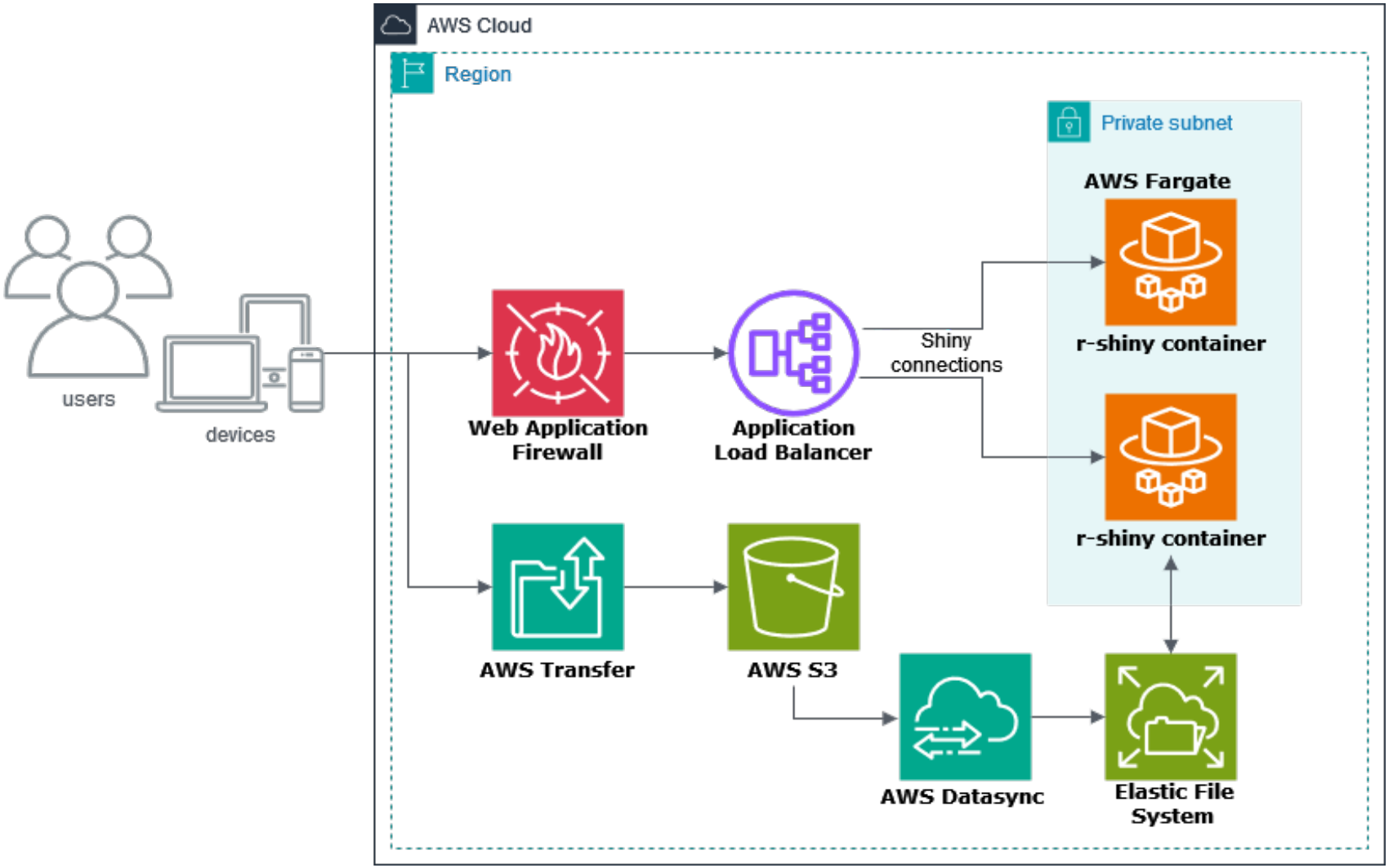
MultiViewPortal
Omics + X Integrator

A comprehensive, centralized approach to multiview data integration, leveraging a unified ecosystem of diverse tools, methods, workflows, and resources

Workflow for MultiViewPortal



Workflow for MultiViewPortal



Interface of MultiViewPortal

home | supervised | unsupervised | filtering

Integrative Modeling

About:

This interactive web application showcases integrative statistical methods by Dr. Sandra Safo and her colleagues. The user can use one of the example datasets provided or uploa
Summary graphics and tables for all methods are displayed once the model is fit.

SCAN ME

Available Methods:

Supervised Methods

SIDA/SIDANet: The Sparse integrative discriminant analysis (SIDA) package implements the SIDA and SIDANet algorithms for joint association and classification studies. The algo
between multi-view data, and the separation within each view when choosing discriminant vectors that are associated and optimally separate subjects. SIDANet incorporates prior structural information in joint association and classification studies. It uses the normalized Laplacian of a graph to smooth coefficients of predictor variables, thus encouraging selection of predictors that are connected and behave similarly.

- SIDA Manuscript
- SIDA R package

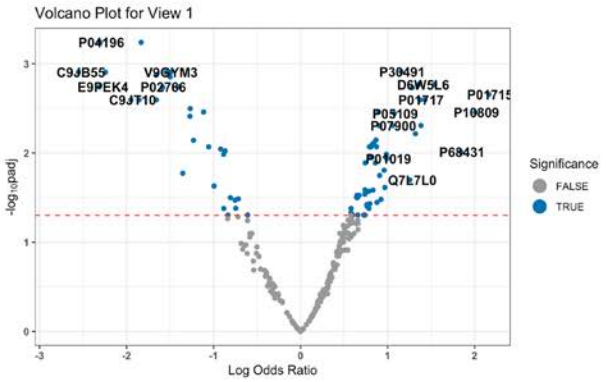
SELP-Predict: Uses the result from SELPCCA to build a prediction model for a continuous, binary, count, or survival outcome. See SELP for more information.

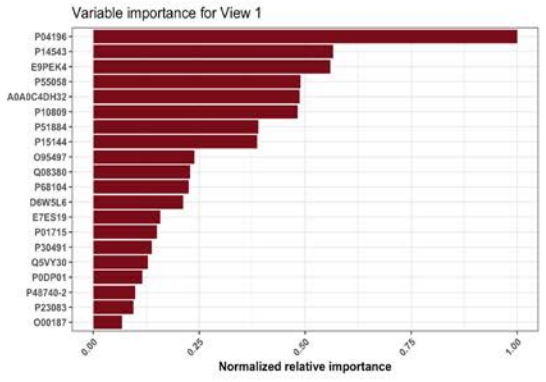
Unupervised Methods

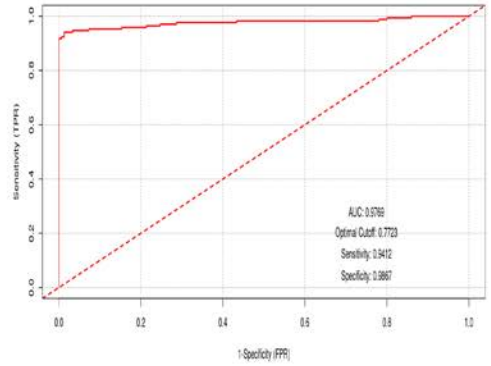
SELP: The SELPCCA package (Sparse Estimation with Linear Programming and Canonical Correlation Analysis) implements SELPCCA to associate two high-dimensional data types. The algorithm obtains a sparse estimate for a solution vector of a generalized eigenvalue problem that identifies the overall dependency between the data types.

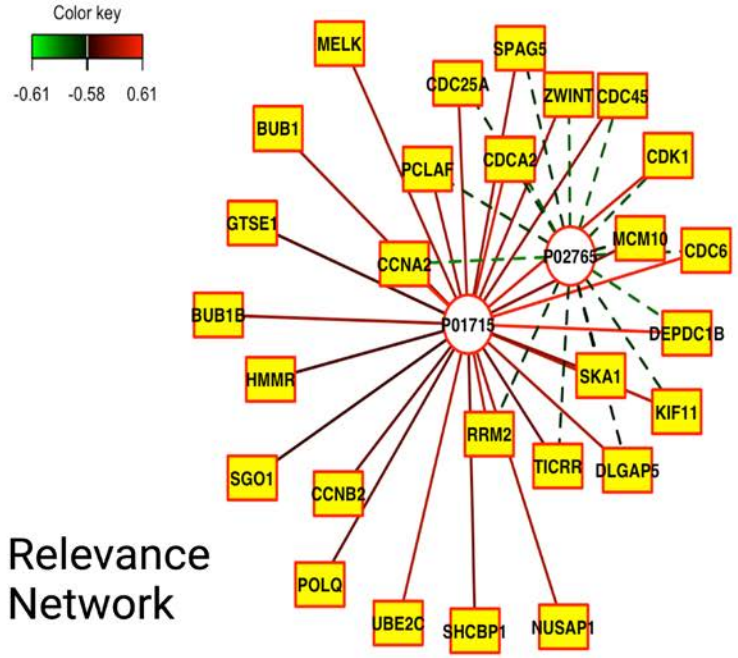
- SELP Manuscript
- SELPCCA R package

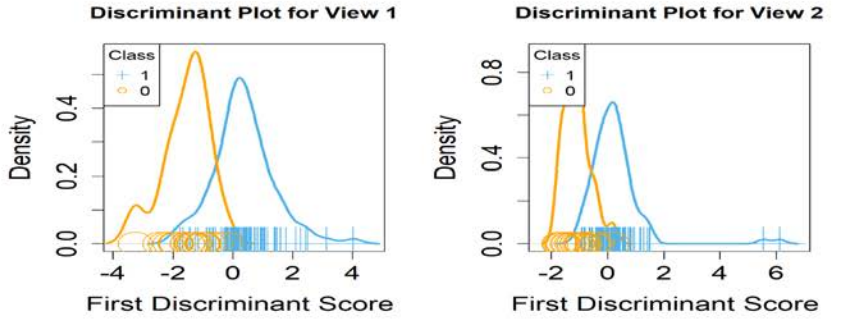
Some Visualizations in MultiViewPortal

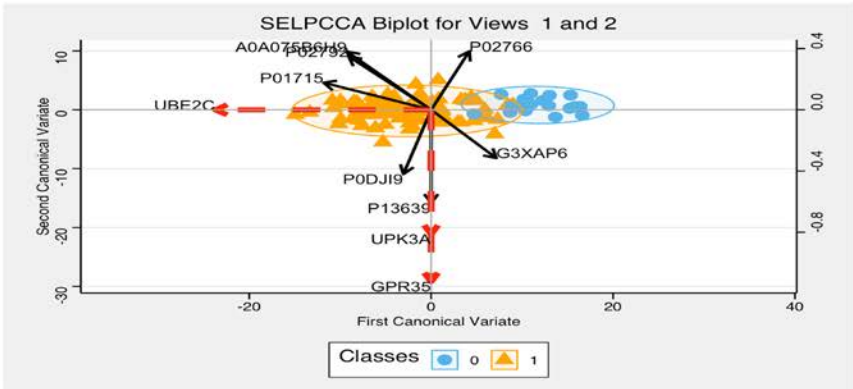












Methods and Packages for Data Integration

- mvlearnR: https://github.com/lasandrall/mvlearnR
  - Contains supervised and unsupervised linear methods for integrating data from multiple sources
- iDeepViewLearn: https://github.com/lasandrall/iDeepViewLearn
  - Contains deep learning methods for integrating data from multiple sources. Capable of variable ranking for interpretability
- RandMVLearn: https://github.com/lasandrall/RandMVLearn
  - Contains kernel methods for integrating data from multiple sources and predicting a binary/continuous outcome. Capable of individual and group variable selection.

Acknowledgments

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