

# (Visual) Analysis of High Dimensional Ensembles

Mai Dahshan

Nicholas Polys

*Computer Science Department, Virginia Tech*



INFORMATION TECHNOLOGY  
ADVANCED RESEARCH  
COMPUTING  
VIRGINIA TECH.

# Semantic Interaction (SI)

- ▶ Under-specified, high-dimensional features are difficult to query for and to define *a priori*

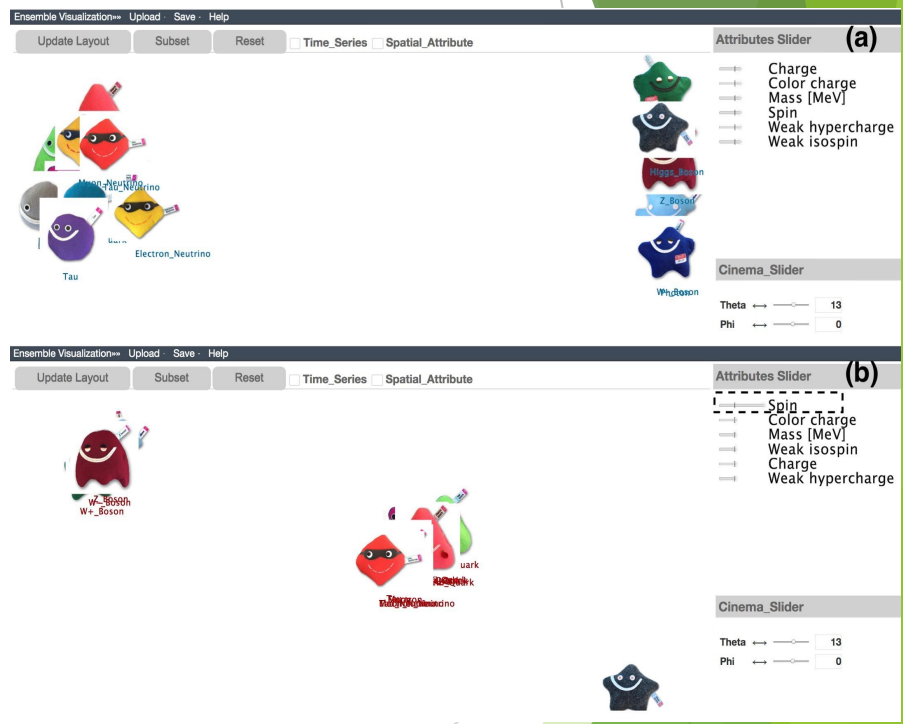
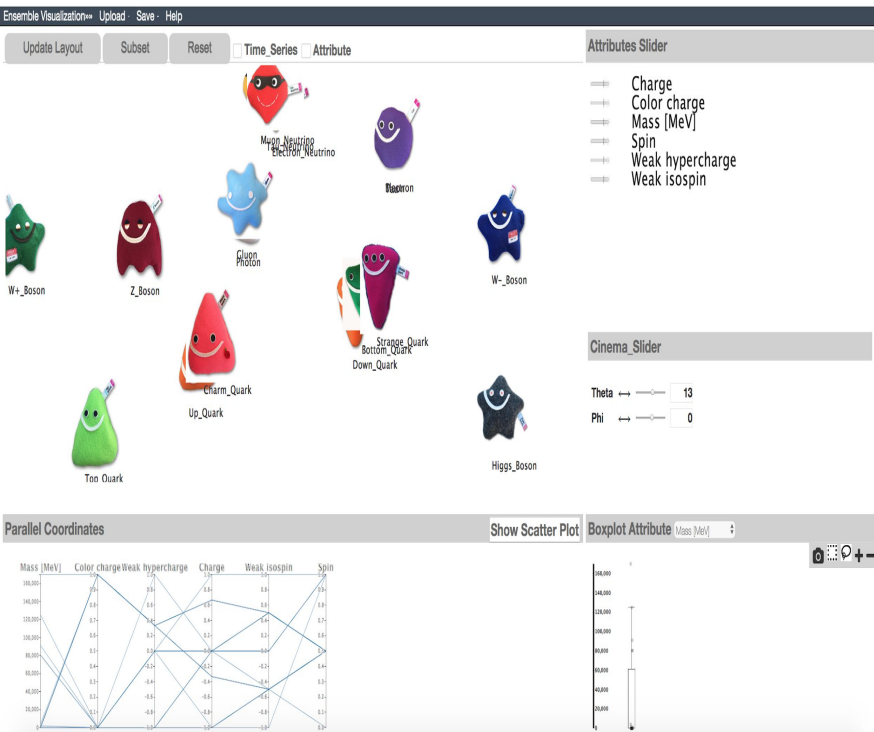
## ***Key points:***

- ▶ High-dimensional data is projected into an interactive low-D workspace for the analyst
- ▶ Leverage the user's expertise and intuition to guide the weighting and projection
- ▶ The machine learns a weighted, High-D model from the user's Low-D interactions
- ▶ Thus, SI shows and explains new features and relationships in the high-dimensional space

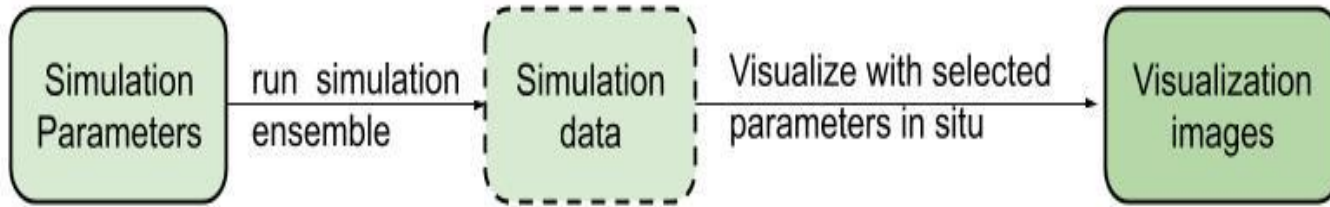


# Semantic Interaction w Particle Zoo:

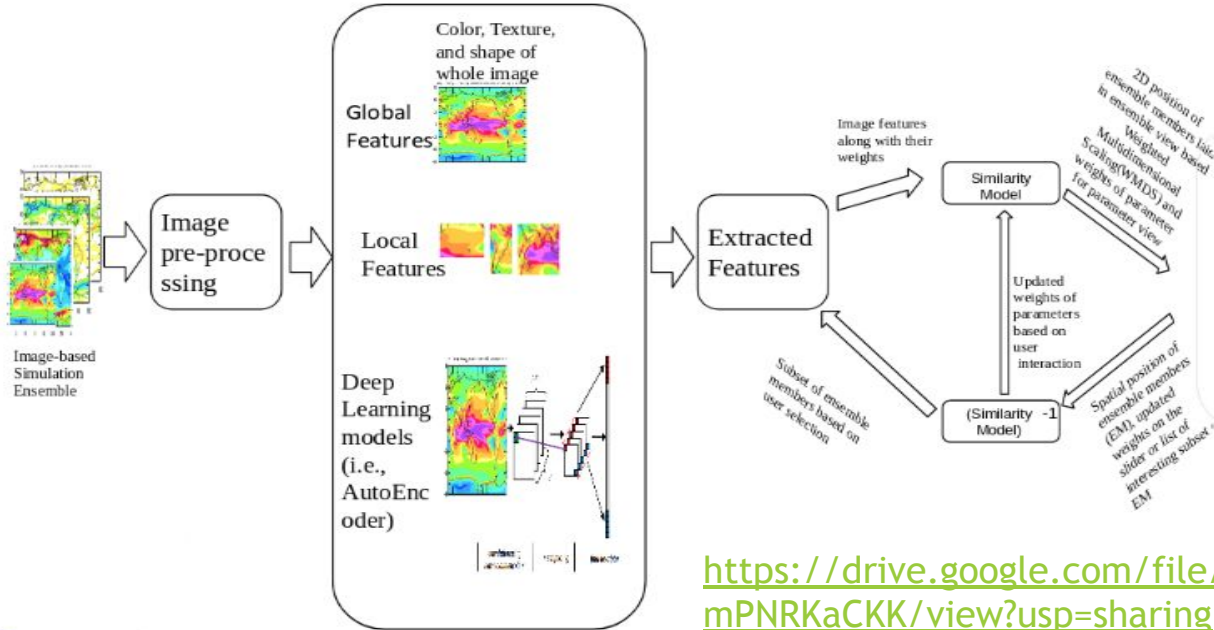
## Standard Model example



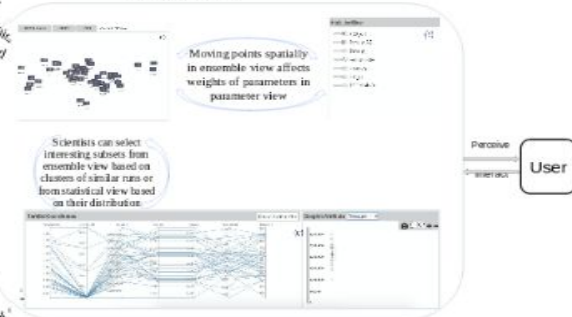
# SI with Image-Based Ensemble



## Feature Extraction

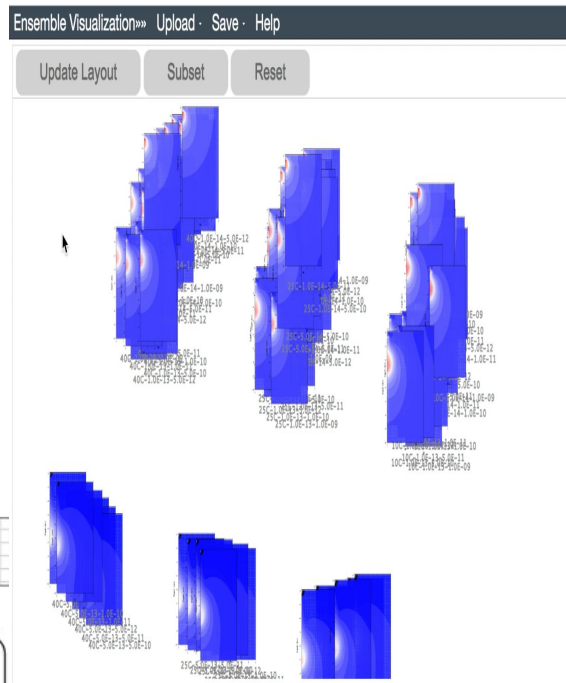
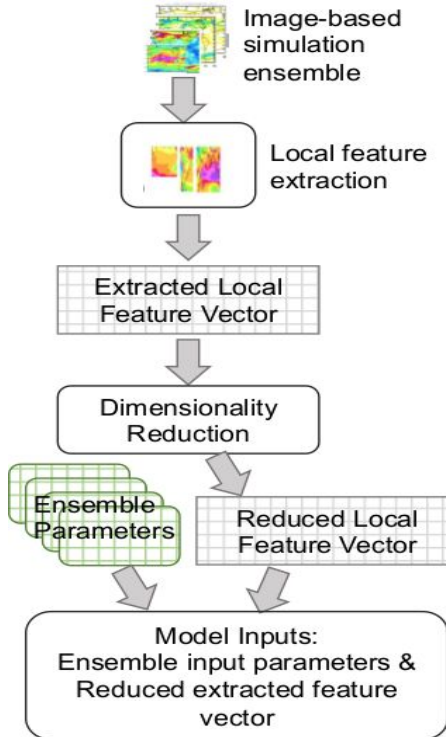


## Visualization

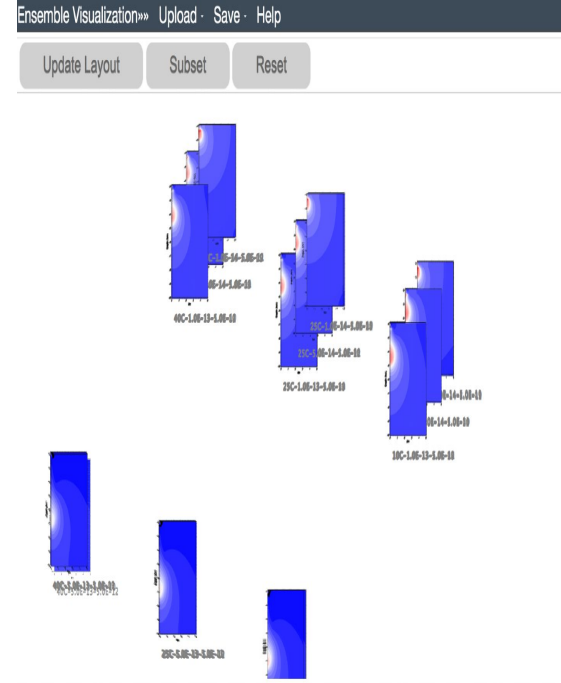


[https://drive.google.com/file/d/1TH9oO9UdAKgFQT\\_t5sP1gs4mPNRkaCKK/view?usp=sharing](https://drive.google.com/file/d/1TH9oO9UdAKgFQT_t5sP1gs4mPNRkaCKK/view?usp=sharing)

# SI Image-Based Ensemble - Example



Autoencoders for DR



PCA for DR