

# Navigating the AI Tsunami in Pharma: Where Actionable Biology Separates Fact from Fiction

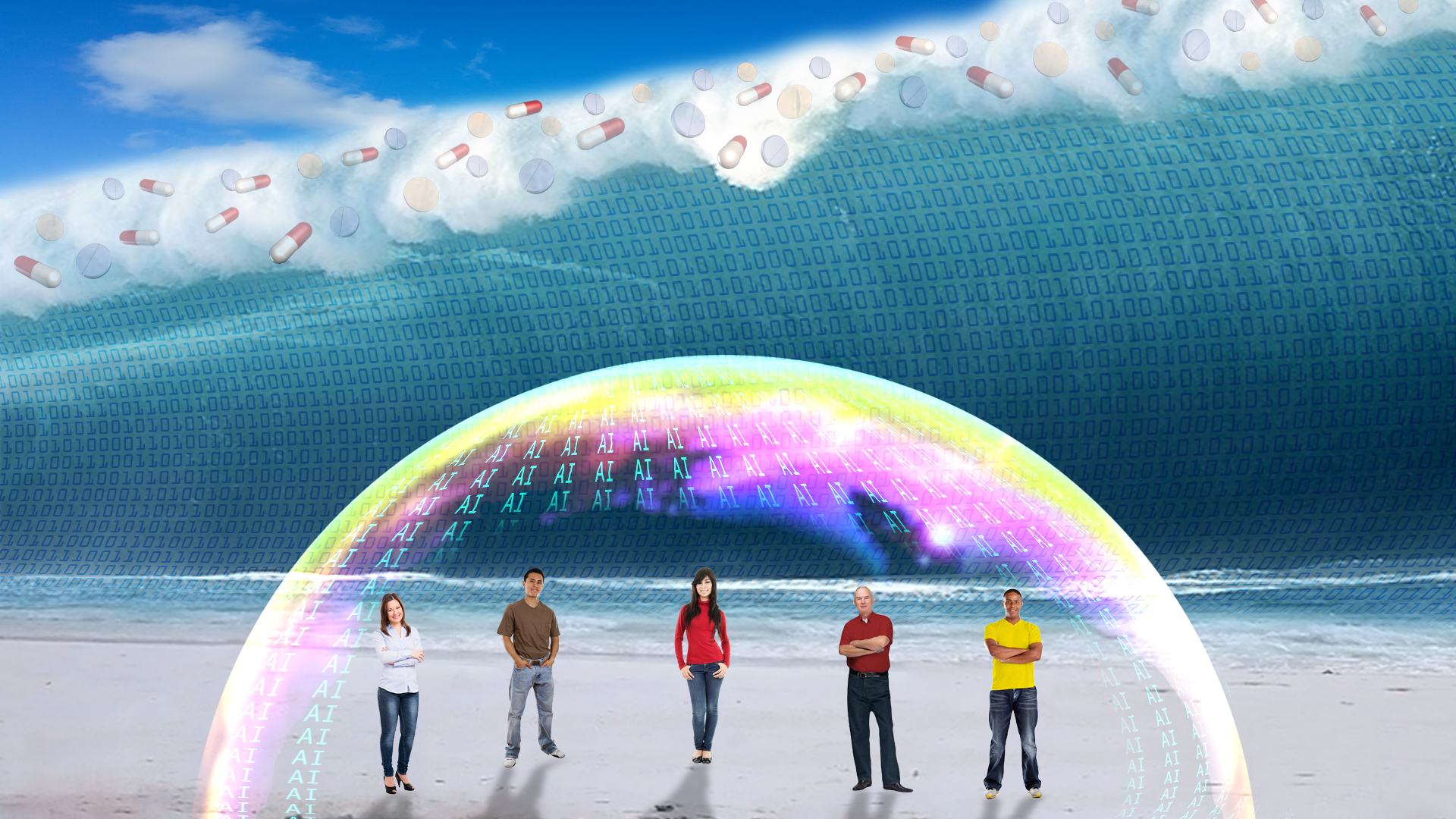
Niven R. Narain Ph.D.

*President, Co-Founder and CEO*



March 15<sup>th</sup>, 2019  
Washington, DC





***“Yesterday has gone, tomorrow has not come,  
Let us begin.”***

~ Mother Theresa



## *Current state of affairs....*



“Without big data analytics, companies are blind and deaf, wandering out onto the Web like deer on a freeway.”

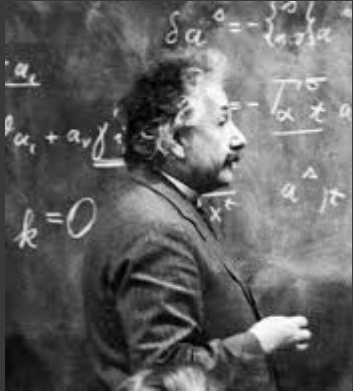
~ Geoffrey Moore, Partner at MDV



“I think you can have a ridiculously enormous and complex data set, but if you have the right tools and methodology then it’s not a problem.”

~ Aaron Koblin, Entrepreneur in data and digital technologies

# *Embracing the challenge of new approaches....*

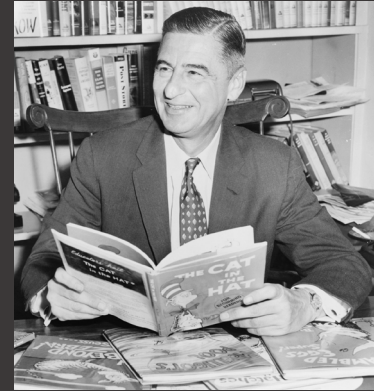


**INSANITY IS  
DOING THE  
SAME THING  
OVER AND  
OVER AGAIN  
AND EXPECTING  
DIFFERENT  
RESULTS.**

**ALBERT EINSTEIN**

YOU'LL **NEVER** BE BORED  
WHEN YOU **TRY**  
SOMETHING **NEW**.  
THERE'S REALLY NO LIMIT  
TO **WHAT YOU CAN DO!**

-DR. SEUSS



*Biology is Diverse and Complex.....*





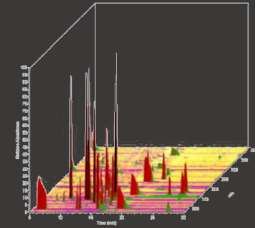
# Innovation has to be balanced with economical solutions that improve outcome and cost

Innovation

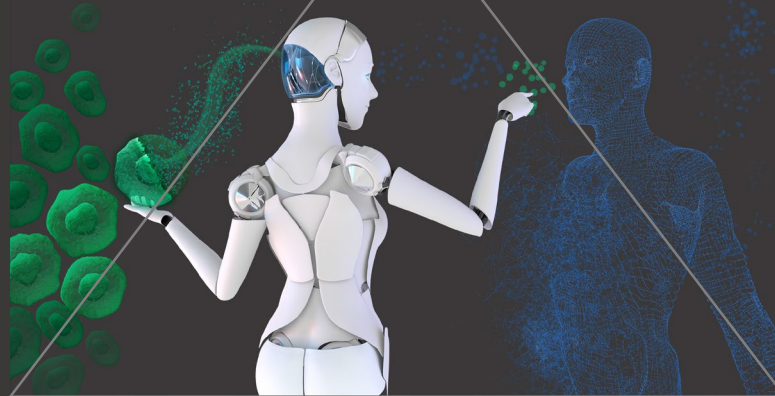


Innovation  $\geq$  <  
Econ**OMICS**

**OMICS**

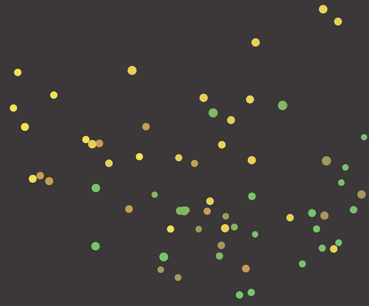


**AI**

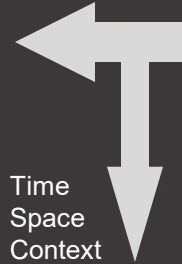




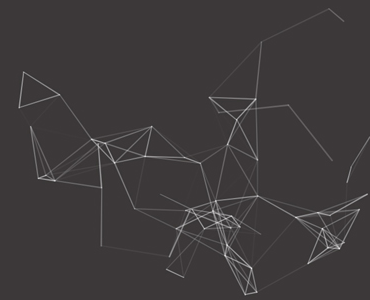
## Reductionism



**Components**



## Systems Science



**Interrelationships  
Dynamics**

### Medical Treatments

- Disease-driven
- Aimed for normalcy (normal range)
- Additive
- “One size fit all”

### Medical Treatments

- Individualized
- Multidimensional use of drugs
- Time-sensitive
- Space-sensitive
- Synergistic



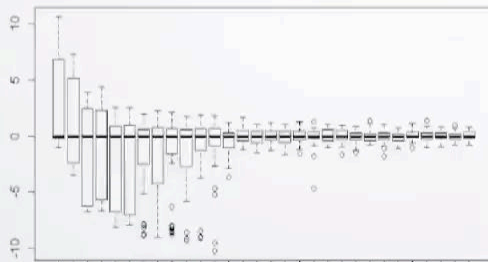
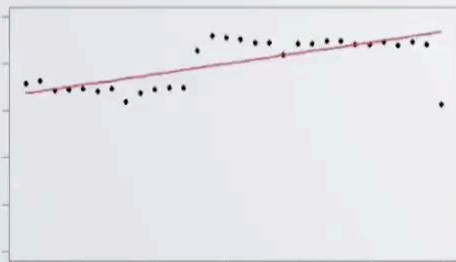
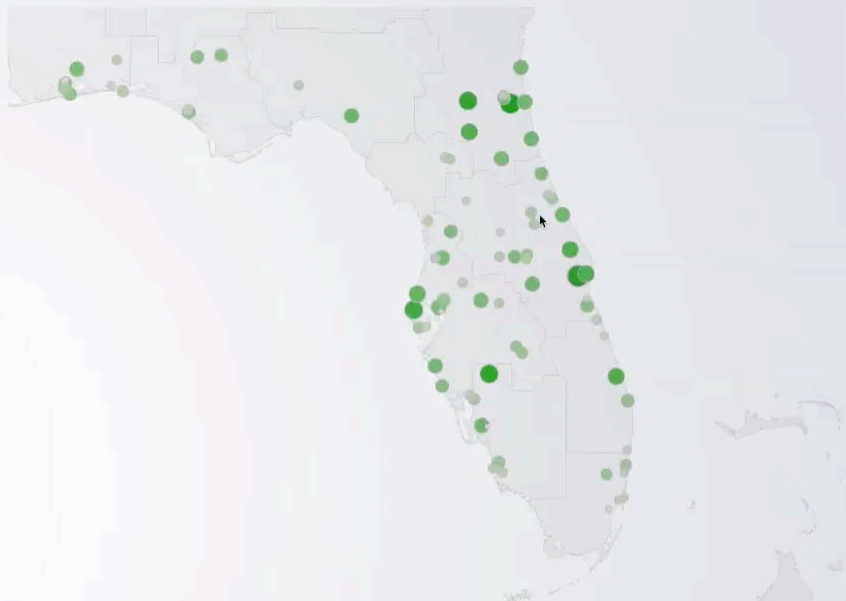
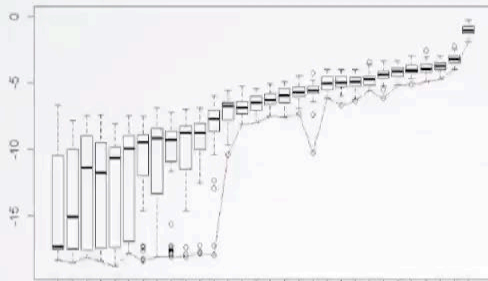
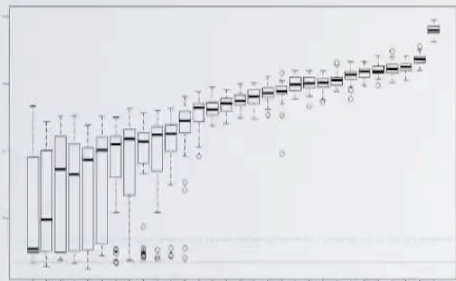
# AI is a tool



**Dr. Atul Butte MD, PhD**  
**Priscilla Chan and Mark Zuckerberg Professor**  
**USCF**

# AI is a tool





demo-190123110318\_1

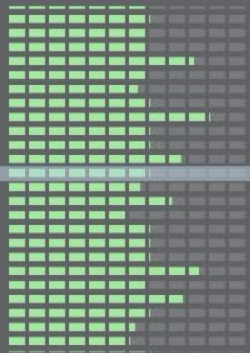
FRAGMENTATION  
UPDATES

TIME  
REMAINING **00:00:29**

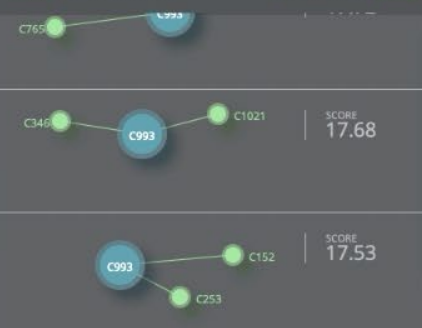
COMPLETED  
GENERATORS **31%**

IN PROGRESS  
GENERATORS **34%**

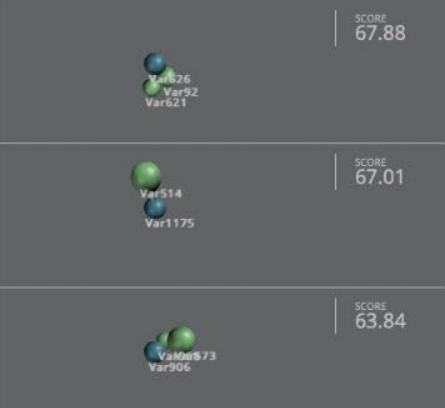
IDLE  
GENERATORS **36%**



**C993 GENERATOR** V-SHAPES: 3982



BEST V-SHAPES



demo-190123110318\_2

ENSEMBLE  
OPTIMIZATION

TIME  
REMAINING **00:03:29**

COMPLETED NETWORKS **0** | NUMBER OF V-SHAPES **16 229 749**

NETWORK **63** SCORE: **11309.61**

GOOD V-SHAPES: **60472**

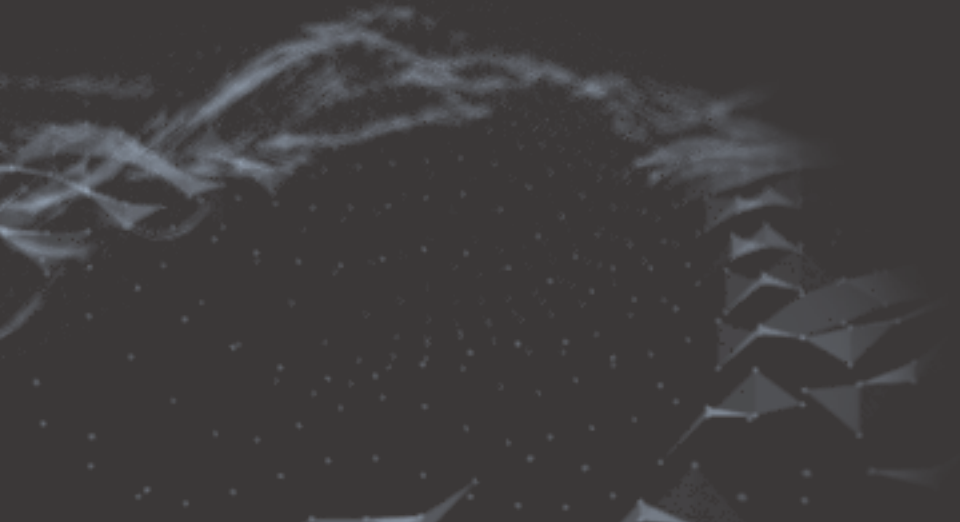


PROGRESS

ENSEMBLE SCORE DYNAMIC



*We need to be HUMBLE to unravel complex biology*



# *Data Driven....*



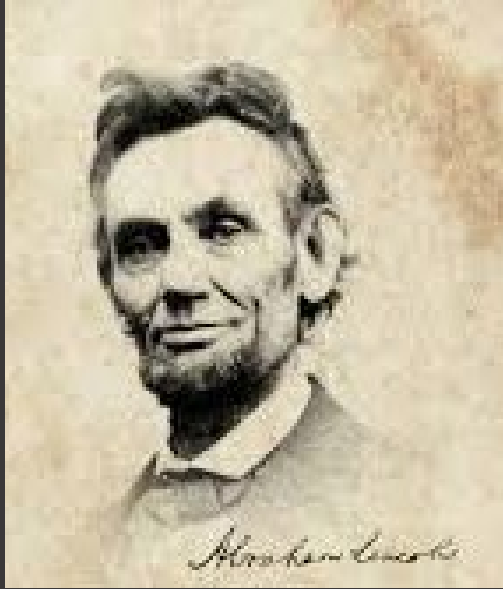
*“The great tragedy of science - the slaying of a beautiful hypothesis by an ugly fact”*

*“Science is simply common sense at its best, that is, rigidly accurate in observation, and merciless to fallacy in logic”*

*“The deepest sin against the human mind is to believe things without evidence”*

~ Thomas Huxley





**"The best way to predict your future is  
to create it"**

~ Abraham Lincoln



THANK YOU

*Dedicated to the patients and families who  
make our research possible*

*And Darrell Abernethy, MD*

