

Data Science for Mobile Health

Susan Murphy

Just-in-Time Behavior
Change Support



Operationalize,
Identify, Treatment
Factors



Experimental
Design



Data Analytics

Personalization &
Continual Learning

Data Science for Mobile Health

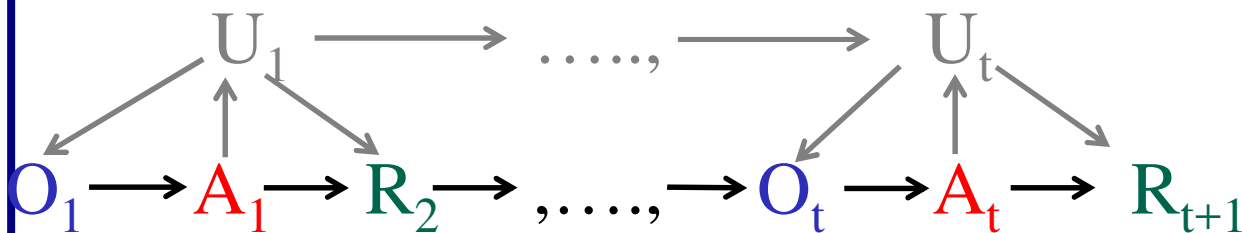


Application Areas

Data Science for Mobile Health

Massive, Sequential,
Factorial, Randomized
Trials

Causal Inference



Unknowns!

Sensor &
Self Report Data

Randomized Treatment
Factors

Responses

Major Data Science Areas

Data Science for Mobile Health

“Reinforcement Learning”
of Interpretable Decision
Rules, $O_t \rightarrow A_t$
from trial data

....., O_t A_t R_{t+1} O_{t+1} A_{t+1} R_{t+2} ,.....

Continual Optimization of Decision Rules,
 $O_t \rightarrow A_t$
as Participant Experiences A_t Treatments
“Online Reinforcement learning”

Major Data Science Areas