

Investigating COVID-19 with R

- Introduction
 - The three big pictures
 - Modeling and decision making
 - COVID-19 from modeling POV
 - The three books

- Data analysis
 - Part 1** 20 min
 - New York Times COVID-19 data
 - Geo-histograms
 - Time series
 - Apple Mobility COVID-19 data
 - Heat-maps
 - Time series
 - Time series search engine
 - Other

- Simulations
 - Part 2** 30 min
 - Decision makers questions
 - Morphological analysis table
 - Epidemiology models overview
 - Compartmental
 - Agent based
 - Cellular automata
 - RIP John Conway
 - Basic compartmental models
 - SIR
 - SEI2R
 - Advanced single-site models
 - SEI2HR-Econ
 - Quarantine modeling
 - Limited resources modeling
 - Interactive interfaces

- Multi-site modeling and simulations
 - Why do this?
 - Multi-site model derivation by graph
 - Adjacency matrix
 - Cell shapes
 - Testing the simulation results
 - Visualization
 - Total across all sites
 - Over graphs
 - 3D propagation waves

- Typical workflows
 - Assign initial conditions
 - Assign rate values
 - Sensitivity analysis
 - Callbration

- Framework design
 - Part 3** 15 min
 - Code-technical part
 - Monads & pipelines
 - Conversational agents
 - ECMMon-R