Zackary Dunivin 8/30/2017
Handout for discussion I-501: Intro to Informatics
Simon, H.A. [1962]. "The Architecture of Complexity"

Some arguments

Hierarchic systems

- "A system that is composed of interrelated [hierarchic] subsystems" some of the subsystems are elementary, terminal and non-hierarchical.
    - Elementary systems may be hierarchical, but to heuristic ends that sub-hierarchy may be ignored: "For certain purposes of astronomy, whole stars, or even galaxies, can be regarded as elementary systems."
- Spatial proximity of systems may not correspond to the most useful description of the relationships in a hierarchy

The evolution of complex systems

- Complexity evolves more quickly when there are stable intermediate systems
    - Such complexity will be hierarchic

Nearly decomposable systems

- The relationships within a system at a particular level in a hierarchic system are stronger than the relationships *between* systems at that same level
- Dynamics at one level are largely, but not entirely, isolated from subordinate or superior levels; this isolation simplifies the behavior of the system

The description of complex systems

- Redundancy allows for condensed description
- Hierarchic systems are usually redundant
- Identifying redundancy may illuminate the structure of an apparently confused system
- Privilege process description over state description

Some questions

- How does Simon's complex system's feedback differ from feedback in a simple system? Say, friction halting a moving object or an active proton pump shutting off
- Do we buy Simon's empire-building example? What are the strengths and weaknesses of hypothesis driven by analogy? What is the place of analogy in contemporary interdisciplinary science?
- Can we think of complex systems that aren't hierarchical and nearly decomposable? Schelling's model of segregation? Conway's game of life? Any real systems?
- Is a complex systems perspective always warranted when studying a complex system? When shouldn't we treat nearly decomposable systems as entirely decomposable? What real systems aren't complex? Only the most reductive?
- What is the relationship between computational or algorithmic thinking and the study of complex systems?
- Is Simon's rhetoric of "description" evidence of a new way of doing science? Does he seem disposed to allowing multiple descriptions of the same domain that do not necessarily contradict one another, but are also not complementary? Is Simon a pragmatist or a positivist? Both? Neither?
- Why are we reading this paper 55 years later? Do Simon's paradigms have a place in complex systems thinking that is not merely historical?