**Computational Science Research Project Prospectus**

Name: Arav Bhardwaj Partner(s): N/A

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| **items** | **response(s)** |
| **TITLE:** what is your working title (final title may be different) | Applications of Cellular Automata in Epidemiology |
| **RESEARCH QUESTION**: What is your (tentative) research question? What are you trying to do/find/learn? | How can cellular automata (CAs) be applied to epidemiology problems? How viable is a cellular automaton compared to preexisting models in the field? |
| **COMPUTATIONAL APPROACH**: What computational tools do you think you will need? (Name software you think you will need) | Python, Stella |
| **KNOWLEDGE BASE**: what do you already know that will help you with this project? What do you need to learn for this project to be successful? | Already know:   * Basic theory behind CAs (from Wolfram’s “A New Kind of Science” and Conway’s Game of Life) * I’ve already created a Python script for basic CA rules, and I’ve forked a CA library on GitHub   Need to learn:   * How to apply epidemiological parameters to cellular automata rules * Need computational parameters for a specific dataset or country e.g., infection probability, recovery probability, death rate, etc. (I could possibly use the Advanced Epidemiology model parameters from Week 5, but I would prefer to use real country data) |
| **LITERATURE SEARCH:** what keywords do you think you will need to conduct a successful search of the literature (including Google and Wikipedia) | Cellular automata, tessellation automata, computational epidemiology, discrete computational systems, nonlinear dynamical systems, etc. |

Chart, waterfall chart

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