

Systems Thinking as an Imperative for Modern Science

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My background

- Ph.D. in Neuroscience from UBC (genetics/molecular biology focus)
- Research Postdoc at Simon Fraser University (Cell biology + genomics focus)
- Teaching Postdoc at UBC with the Master of Data Science (MDS) program
- Currently, UBC Instructor with Dept. of Statistics & MDS program, and Option Co-Director of the MDS program

In a world where data sets are larger and larger, and more complex, how do you approach designing your analytical strategy to maximize insights gained?

1. Focus and spend time on the research question.
 - it should be good (e.g., specific, answerable, plausible framework - well sometimes)
 - you should be aware of the kind of question it is (e.g., exploratory, predictive, inferential)
2. Map your analysis to your research question (this can often go wrong, see [Leek & Peng, 2015](#)).
3. Get the simplest reasonable version of the analysis working first. Then iterate over the computational and scientific hurdles as you refine your analysis.
4. Use reproducible Data Science tools to mitigate chaos and maximize transparency, reproducibility, and productivity.