15-400 Project Milestone 2
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What You Have Accomplished Since Your Last Meeting/Meeting Your Milestone

Redirecting the project. Instead of formal modeling a given biophysical/biochemical system, use mainly statistical simulation to gain insights into the dynamics/pathway of the system. This makes the project much more feasible and tangible, while leaving the possibility of extending the project to formal approaches.

- Project Overview/Goals:
  Exact mechanisms of biological processes are not always observable from wet experiments; however many biomedical application rely on our understanding of those dynamics. By modeling and running simulation that matches high-level experimental data, we can potentially verify/refute some of the hypothesis about those mechanisms (including structural formation, pathway dominance)

- Source of experimental data:
  Structural formation of Huntingtin Exon 1 aggreagates (Huntington's disease)
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093554/

- Possible application of formal methods:
  - model checking
  - Spatial information/geometry representation in programs

Major Changes to the Milestones:
- March 1st: more literature search on (1) general simulation algorithm (2) Huntington's aggregation pathway and its clinical significance
- March 22nd: determine the target model and its simulation algorithm
- April 5th, implement the simulation algorithm of the model
- April 19th, simulation analysis, possibly formal approach as an add-on
- May 3nd, prepare for poster/presentation, report write up

Looking Ahead: What do you plan to focus on and accomplish over the next two weeks?
I am planning to focus on understanding existing modeling simulation methods (main algorithms, limitations). In addition, I will try to make as much connection/comparison as possible to my previous study of rule-based modeling and some of the formal approaches used there, to get a better overview of the bigger picture.

Resources: Book: Quantitative Biology, theory, computational methods, and models