VISUALIZING ALGORITHMS AND LARGE DATASETS

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Project description. A mathematical visualization becomes much more expressive when it is made *interactive* or *animated*. In this project, students will build on existing tools to create a framework to generate dynamic, interactive visualizations. Early on, we will focus on animated visualizations of standard algorithms, possibly including some algorithms that arise in machine learning. Graph algorithms, dynamic-programming algorithms, and algorithms that approximately solve NP-complete problems are some other examples of what we might try to animate.

Tools to extract qualitative, human-readable information from large datasets are more important than ever, since large datasets are so abundant. The visualization tools created during the first part of the project should be flexible enough that we can adapt them visualize and explore large datasets (for example, a dataset from Wikileaks such as the DNC email dump). This will be the focus of the second part of the project.

Prerequisites. Math 217 and some programming experience, preferably with Python. Familiarity with D3.js or javascript would be helpful, but isn't essential. Math 416 (Algorithms) or Math 498 (Machine Learning) would be helpful, but neither is essential.

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