GRAPHic Design

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AcademyNEXT
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Overview

With the growth of technology and social networking, graphs have become increasingly prominent in the modern world. Drawing graphs is vital for humans to be able to understand the data they present.

We have made a program that generates a visual representation of a graph/network using springs and electromagnetic forces.

Goals

1. Create an engine to simulate physical, force-directed interactions between nodes and their edges.
2. Implement random model generation using NetworkX.
3. Create an easy to use, intuitive user interface.
4. Make a visually appealing design for to make your graph aesthetically pleasing while being easy to understand.

Specifications

Nodes act as similarly-charged particles (creating a repulsive force) while edges act as springs (preventing nodes from moving apart infinitely). Friction prevents constant change of the graph. Graph specifications and force specifications can be customized during the graph drawing process.

Challenges

I.   Physics engine

Coding the force-directed model was a big challenge as it was often difficult to keep nodes from moving infinitely apart from each other or overlapping. Deciding on default parameters for the model also required many tests on different graph types.

II.   UI

Creating an intuitive, aesthetically pleasing, and easy to use UI was difficult, and took several days to design, and then to implement.