CS360 - Final Project: Visualizing Nuclear Power Throughout History (ALPHA RELEASE)

Eran Young
Email: eranyoung1@gmail.com
Project Repository: https://eranyoung.github.io/NuclearVis/

Key:
✓ = Completed
✓ = Partial Completion
✗ = Not Yet Completed

Background and Motivation

This project was inspired by the 2022 Russian invasion of Ukraine and the resulting increased threat of nuclear warfare. With people divided on whether the United States should go to war with Russia, I wanted people to know the threat to our entire world that a nuclear war would pose, given the current nuclear capabilities of both nations.

Project Objectives

Through this project I intend to convey the true threat that nuclear weapons pose in our modern day and show how that threat has grown since the technology's conception and how it remains today despite international laws. I also want to highlight the stark contrast in nuclear power between nations, especially the United States and Russia. Objectives of this project include:

1. Users being able to visualize nuclear power increasing over time
2. Being able to see the consolidation of nuclear power in key countries
3. Compare the nuclear power of key countries year by year
4. Visualize the effect of any countries nuclear power

Must Have Features

[Link to website with visualizations]

- Line Graph which shows countries' nuclear power over time. This feature corresponds to Objective 1. ✓
- Bubble Chart to show proportions between different countries' nuclear power. This feature corresponds to Objective 2. ✓
    - Will be scrollable so you can see how these proportions change over time. This feature corresponds to Objective 3 ✓
    - When you click on a data point on the line graph, the bubble chart will render that point in time ❌
- Pictogram-esque chart that shows the amount of nukes (scaled). This feature corresponds to Objective 4. ✓

Optional Features

- Line graph can be zoomed in to take a closer look at a specific point in time, Add annotations which show important historical moments relevant to nuclear weapons development. ✓ (partial completion, zoom is completed but no annotations)
- Annotations for the pictogram which will tell the user the area that can be blown up with that amount of power ❌
- Animations for the pictogram which show the dynamite dropping into the container. ❌
- When scrolling on the bubble chart, a vertical line on the line graph will also move back and forth to show the time. ✓ (partial completion, vertical line is implemented but no chart sync)

Project Schedule

3/11	Initial Project Proposal ✓
3/23	Final Project Proposal. Setup Project

	website. ✓
3/25	Line graph, Bubble Chart, Pictogram basic completion. ✓
4/1	Chart integration with page layout ✓
4/6	Alpha Release ✓
4/15	Add additional functionality, sync animations across charts ✓
4/20	Make it pretty! Work on CSS and clean up design in general ❌
4/29	Beta Release. Complete Project Presentation. ❌
5/6	Add optional features. Complete Project Report Draft. ❌
5/12	Cleanup code and documentation and finalize the report. Project completion! ❌

Upcoming Immediate Milestones

- Completing the pictogram with a custom nuclear warhead svg and scale amount of icons with the size of the window, animate this chart
- Clean up CSS and make design more cohesive.
- Add more data for historical descriptions of important years

Roadblocks

- Syncing the line chart tooltips with the timeline slider which is another file
- Getting the data for the historical descriptions

Related Works

Wilke, Claus O. Fundamentals of data visualization: a primer on making informative and compelling figures. O'Reilly Media, 2019.

Murray, Scott. Interactive data visualization for the web: an introduction to designing with D3. " O'Reilly Media, Inc.", 2017.

James Eagle Featured Creator. “Animated Chart: Nuclear Warheads by Country (1945-2022).” *Visual Capitalist*, 21 Mar. 2022, https://www.visualcapitalist.com/cp/nuclear-warheads-by-country-1945-2022/.

Omri Wallach Graphics/Design: “Which Countries Have the Most Nuclear Weapons?” *Visual Capitalist*, 30 Sept. 2021, https://www.visualcapitalist.com/which-countries-have-the-most-nuclear-weapons/.

“Understanding Animated Graphs in d3.Js.” *Daniel Rotter*, 12 June 2020, https://danielrotter.at/2020/06/12/understanding-animated-graphs-with-d3js.html.