

Data Girls - Milestone 2

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1 Introduction

In today's evolving data science job market, understanding what drives job transitions and salary trends is key for both aspiring professionals and industry stakeholders. This project explores how education, experience, demographics and company factors influence job-seeking behavior and compensation. By analyzing job transition patterns and salary data across roles and locations, we aim to uncover what makes certain career paths more attractive or stable and highlight disparities that can inform career planning.

2 Design

We want to create an interactive web visualization that allows users to explore insights about job mobility and salary trends in data science. The website will feature three pages, each focusing on a different aspect of the analysis, from job-seeking behavior to salary disparities. Each page begins with high-level insights and allows users to dive deeper through interactive elements. This structure is designed to make the data accessible and engaging for students, professionals and recruiters alike.

2.1 Home Page

This website offers an engaging and interactive visualization of career transitions and salary trends in the data science field from 2020 to 2023. It introduces users to five key roles: Data Analyst, AI Engineer, Data Engineer, Data Scientist, and Machine Learning Scientist, through a visual and intuitive layout. We plan to add interactive hover tooltips for each job title. These pop-ups will display concise role definitions, key skills, common tools, entry-level salary insights and trends in demand since 2020. This feature aims to provide users with brief and concise information as they explore different career paths within data science.

2.2 Job Seeking Page

The Job Seeking page is designed to offer users a deeper look into the factors that influence whether professionals in the data science field are actively looking for new opportunities. We begin by presenting key visualizations that give an overview of job-seeking trends across different dimensions: a pie chart shows the distribution of job seekers across company types; a grouped bar chart compares the number of job seekers and non-seekers across different career stages (see Figure 1); a line graph displays how the average probability of job seeking correlates with different ranges of training hours (see Figure 2).

After these high-level visuals, we move into a more analytical view of the data: a correlation Heatmap that highlights how different variables relate to the target variable. Building on this foundation, we offer an interactive prototype prediction tool. Users can input their profile (e.g., gender, training hours, company size) and the model outputs how likely that person is seeking for a job. While this tool is still a work in progress, it demonstrates the application of predictive modeling in career analytics and gives users a personalized experience (see Figure 3). This page ultimately guides users through a journey, from exploring patterns in job-seeking behavior to understanding the variables that drive those patterns and finally interacting with a model to simulate real-world use cases.

2.3 Salary Page

The Salary page will offer users an interactive exploration of compensation trends across data science roles. Users will be able to view a bubble chart (see Figure 4) where each bubble represents a job title sized by its average salary. Clicking on a bubble will reveal more detailed salary insights below. For each selected job title, the page displays a salary distribution histogram to help users understand how salaries vary within the role. It also shows a line chart to illustrate the evolution of average salary from 2020 to 2023. Additionally, a plot of Salary vs. Experience Level provides insight into how compensation scales with seniority within a given position. Users can filter all these visualizations by country. If no country is selected, the plots display global data including countries that are not explicitly listed in the filter options due to the limited number of data points available for each individual country in the dataset.

3 Tools

For this project, we used a mix of web technologies and visualization tools to bring our insights to life. The general structure and styling of the website is developed using HTML and CSS to ensure a clean, responsive, and visually cohesive layout across all pages. To bring job-seeking and salary data to life, we have used Chart.js, a powerful JavaScript library known for creating interactive and responsive visualizations. This allows us to display dynamic bar, pie, and line charts that users can explore seamlessly. While most plots are generated programmatically, The correlation heatmap was designed on iPad and the prediction tool interface was mocked up in Draw.io to represent planned interactivity. Together, these tools create a visually rich and user-friendly environment for exploring career trends in data science.

4 Relevant Lectures

The majority of the tools and concepts used in our project are grounded in the course's lecture content. Our work is primarily shaped by Lectures 1 through 5, which introduced us to the technical foundation of building and enhancing a data-driven website, ranging from HTML and CSS to JavaScript and D3.js. Lecture 6 which covers visual perception played a crucial role in guiding our use of perceptually accurate and accessible color schemes especially for users with color blindness. As we continue refining the clarity and layout of our visualizations, Lecture 7 guided us in designing clear, uncluttered plots. Looking ahead, Lecture 12.1 on storytelling will support the narrative structure of our website as we refine user flow and insight delivery.

5 Extra Ideas

As an additional feature, we plan to enhance the user experience by connecting the three pages through a smooth scrolling transition. Specifically, scrolling down from the Home page would lead users directly to the Salary page and continuing to scroll would transition to the Job-Seeking page. This would create a more intuitive and fluid navigation flow across the website. We plan to revisit the overall design and user experience of our website with a focus on visual appeal and usability. We will incorporate the design principles and technical knowledge we have gained throughout the semester to enhance engagement and interactivity. We want to build our site with React, TypeScript, JavaScript and CSS. We are also exploring ways to keep our code organized and styling more maintainable by using CSS Modules or styled-components. These tools help us create a clean, responsive design while keeping the development process smooth and efficient.

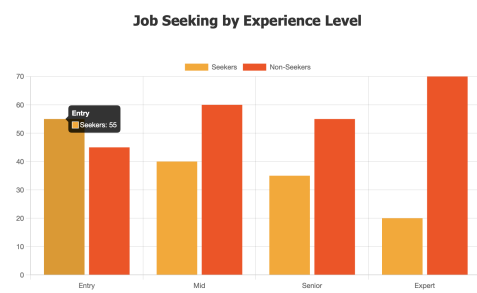


Figure 1: Job Seeking by Experience Level.

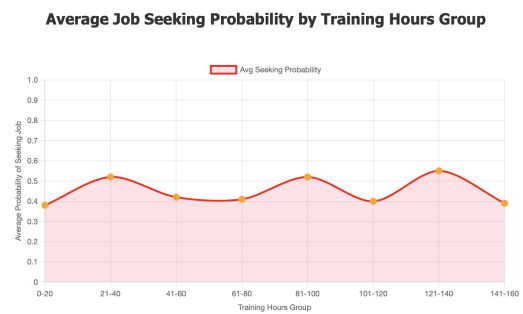


Figure 2: Average Job Seeking Probability by Training Hours Group.

Job-Seeking Behavior Predictor

Gender

Female ▼

Training Hours

45

Company Size

50-99 employees ▼

Prediction Result

30%

Low

High

Predict

Figure 3: Predicting Job-Seeking Status.

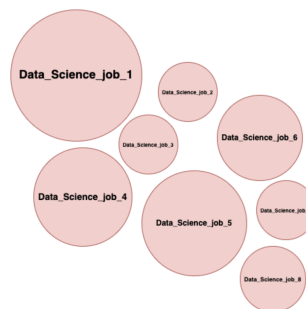


Figure 4: Bubble Chart – Job Titles Overview.