EXHIBIT

C

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF THE DISTRICT OF COLUMBIA

CITIZENS FOR CONSTITUTIONAL INTEGRITY, Plaintiff, v. THE CENSUS BUREAU, *et al.*, Defendants.	No. 1:21-cv-3045

AYUSH SHARMA DECLARATION

1. My name is Ayush Sharma, and I am a Data Scientist. I analyzed the equation in the Fourteenth Amendment, Section 2. Under four different scenarios, I calculated various bases of representation and redistributed seats in the U.S. House of Representatives according to the method of equal proportions.

I. Educational and work background

2. In December 2015, I obtained my Master's Degree in Electrical and Computer Engineering from Georgia Institute of Technology. I graduated with a grade-point average (GPA) of 3.8. A lot of my graduate work related to machine learning and required me to apply statistical tests to infer the statistical significance of a specific hypothesis or algorithm.

3. One such instance was publishing a research paper titled "Deep emotion recognition using prosodic and spectral feature extraction and classification based on cross validation and bootstrap." A. Sharma and D. V. Anderson, *2015 IEEE Signal Processing and Signal Processing Education Workshop (SP/SPE)*, 2015, pp. 421-425, doi: 10.1109/DSP-SPE.2015.7369591. The paper gave me the opportunity to use my knowledge of audio signal processing and statistics to

prove that the methodology we designed improved the emotion recognition from the state-of-the-art techniques. A dataset where 8 actors voiced 15 different emotions was used as a basis for building the model. Emotions are classified on two scale – valence and activation. Valence deals with the positivity or negativity of the emotion. Activation deals with the intensity or pitch associated with the emotions. By building a model that differentiates emotions by plotting them on this coordinate scale of valence and activation, we were able to demonstrate a reliable way to classify a complex emotion among the 15 emotions.

4. In 2016, I joined Mogean, a geospatial analytics startup company as a data scientist, and I began working on several projects that required applying statistical analyses. My responsibilities as a data scientist include implementing applied statistics to the real-time data generated by our clients and finding actionable insights to help them make better business decisions. Among my tasks, I helped create a propensity scoring system for our clients that given their customers' patterns and behaviors ranks them in order of how likely they are to visit the clients' stores. I also designed marketing campaigns for digital brands to enable them to locate their ads to better measure the efficacy of their advertisement campaigns.

5. To gain more depth in my understanding of the theoretical concepts of statistics, I completed my second masters in Statistics and Analytics from Harrisburg University of Science and Technology. I graduated with a GPA of 3.8 in 2020.

6. In March 2020, I was promoted to the position of Chief Data Scientist. Some of the responsibilities include designing and evaluating statistical analyses for solving clients' problems and challenges. I lead and supervise a team of data analysts to ensure best practices are followed while using statistical tests.

II. Analysis

7. I conducted the four-scenario analysis of the Fourteenth Amendment, Section 2, in RStudio, an open source and professional software for data mining. To further elaborate the analysis, the four different scenarios will be explained in detail.

8. To distribute seats using the method of equal proportions, I relied on the Census Bureau's Computing Apportionment description of the method. Census Bureau, Computing Apportionment (Nov. 22, 2021), https://www.census.gov/topics/public-sector/congressional-apportionment/about/computing.html. That method requires distributing one seat to each state. For each additional seat, it calculates a set of priority values among all of the states and assigns each additional seat to the state with the next priority value.

A. Data Sources

9. For the Census Bureau's actually enumerated population statistics, I used data from the Census Bureau's website, 2020 Census Apportionment Results (Apr. 26, 2021), https://www.census.gov/data/tables/2020/dec/2020-apportionment-data.html. Specifically, I relied on Table 1, Apportionment Population and Number of Representatives by State: 2020 Census. Ex. 1. During my work, for comparison, I also referred to the Census Bureau's table of Priority Values for 2020 Census Apportionment, Ex. 2.

10. For voting registration rates and citizenship percentages, I used data from the Census Bureau's website, Voting and Registration in the Election of November 2020 (Apr. 2021), https://www.census.gov/data/tables/time-series/demo/voting-and-registration/p20-585.html. In particular, I relied on Table 4a, Reported Voting and Registration for States: November 2020, Ex. 3. I referenced the Census Bureau's description of its method to ensure I used the correct figures. Current Population Survey, November 2020, Voting and Registration Supplement, Technical Documentation, Ex. 4.

11. I took the estimates of citizens who cannot vote because of a criminal conviction from the Sentencing Project's study, Locked Out 2020: Estimates of People Denied Voting Rights Due to a Felony Conviction (October 15, 2020, updated October 30, 2020), Ex. 5.

12. I used 300,000 as the number of registered voters disenfranchised by Wisconsin's photo voter ID law. *Frank v. Walker*, 17 F. Supp. 3d 837, 884 (E.D. Wis. 2014), *overturned on other grounds by* 768 F.3d 745, 746 (7th Cir. 2014), *r'hrg en banc denied*, 773 F.3d 783, 785 (2014).

B. Scenario Descriptions

13. In Scenario 1, I tested the accuracy of the algorithm I designed. I tested whether the algorithm would replicate the Census Bureau's results for apportioning seats in the U.S. House of Representatives among the states. Out of the total 435 seats to be distributed, the first 50 seats were given one to each state, and the remaining 385 were distributed according to the method of equal proportions algorithm. The results of the seat distribution are presented in the results section.

14. In Scenario 2, I replaced the actual enumerated population statistic in the method of equal proportions formula with "basis of representation," based on voter registration rates in each state. This "basis of representation" equation in the Fourteenth Amendment, Section 2, requires identifying, for each state, (1) the number of citizens, and (2) the number of citizens over 18 years of age who can vote, plus the Sentencing Project's estimated number of citizens who cannot vote because of a criminal conviction. To calculate the "basis of representation" figure for each state, the Fourteenth Amendment requires multiplying the proportion of citizens who can vote ((citizens who can vote plus citizens who cannot register because of criminal convictions) to the number of citizens) by the Census's actually enumerated population statistic. The results are presented in the next section.

15. Scenario 3 is similar to Scenario 1 in all respects, but one. Scenario 3 replaces Wisconsin's actually enumerated apportionment statistic with Wisconsin's "basis of representation." For Wisconsin's "basis of representation," this scenario subtracts 300,000 people from Wisconsin's citizens registered to vote, because those citizens were disenfranchised by Wisconsin's photo voter identification (ID) law, and it adds the Sentencing Project's estimated number of citizens who cannot vote because of criminal convictions. Again, to calculate the "basis of representation," the Fourteenth Amendment requires multiplying the proportion of citizens who can vote ((citizens who can vote plus citizens who cannot register because of criminal convictions) to the number of citizens) by the actually enumerated population statistic.

16. Scenario 4 is similar to the methodology for Scenario 2 in all respects, but one. In addition to calculating each state's basis of representation based on voter registration rates, Scenario 4 subtracts 300,000 people from the number of registered voters over 18 years of age in Wisconsin who were disenfranchised due to Wisconsin's photo voter ID law. In other words, it calculates all states' basis of representation after accounting both (1) for each state's voter registration rates and (2) for registered voters disenfranchised due to Wisconsin's photo voter ID law.

III. Results

17. This section presents the distribution of house seats as a result of applying the method of equal proportions algorithm to the four scenarios.

A. Scenario 1

18. In Scenario 1, my objective was to verify the accuracy of the algorithm developed and to determine whether the results match the seat distribution by the Census Bureau. Table 1 presents the results.

State	Scenario 1 Seats	Census Bureau Seats	Change	State	Scenario 1 Seats	Census Bureau Seats	Change
Alabama	7	7	0	Montana	2	2	0
Alaska	1	1	0	Nebraska	3	3	0
Arizona	9	9	0	Nevada	4	4	0
Arkansas	4	4	0	New Hampshire	2	2	0
California	52	52	0	New Jersey	12	12	0
Colorado	8	8	0	New Mexico	3	3	0
Connecticut	5	5	0	New York	26	26	0
Delaware	1	1	0	North Carolina	14	14	0
Florida	28	28	0	North Dakota	1	1	0
Georgia	14	14	0	Ohio	15	15	0
Hawaii	2	2	0	Oklahoma	5	5	0
Idaho	2	2	0	Oregon	6	6	0
Illinois	17	17	0	Pennsylvania	17	17	0
Indiana	9	9	0	Rhode Island	2	2	0
Iowa	4	4	0	South Carolina	7	7	0
Kansas	4	4	0	South Dakota	1	1	0
Kentucky	6	6	0	Tennessee	9	9	0
Louisiana	6	6	0	Texas	38	38	0
Maine	2	2	0	Utah	4	4	0
Maryland	8	8	0	Vermont	1	1	0
Massachusetts	9	9	0	Virginia	11	11	0
Michigan	13	13	0	Washington	10	10	0
Minnesota	8	8	0	West Virginia	2	2	0
Mississippi	4	4	0	Wisconsin	8	8	0
Missouri	8	8	0	Wyoming	1	1	0

Table 1: Scenario 1 Results

19. Exhibit 6 shows the priority values I calculated and shows that they match almost exactly the Census Bureau's table of Priority Values for 2020 Census Apportionment.

20. After ascertaining the accuracy of the algorithm, I implemented Scenarios 2, 3, and 4.

B. Scenario 2

21. Table 2 shows the results of Scenario 2, which calculates the "basis of representation" figure based on voter registration rates.

State	Scenario 2 Seats	Census Bureau Seats	Change	State	Scenario 2 Seats	Census Bureau Seats	Change
Alabama	7	7	0	Montana	2	2	0
Alaska	1	1	0	Nebraska	3	3	0
Arizona	10	9	+1	Nevada	4	4	0
Arkansas	4	4	0	New Hampshire	2	2	0
California	49	52	-3	New Jersey	14	12	+2
Colorado	7	8	-1	New Mexico	3	3	0
Connecticut	5	5	0	New York	25	26	-1
Delaware	1	1	0	North Carolina	13	14	-1
Florida	28	28	0	North Dakota	1	1	0
Georgia	14	14	0	Ohio	16	15	+1
Hawaii	2	2	0	Oklahoma	5	5	0
Idaho	2	2	0	Oregon	6	6	0
Illinois	17	17	0	Pennsylvania	17	17	0
Indiana	8	9	-1	Rhode Island	2	2	0
Iowa	4	4	0	South Carolina	6	7	-1
Kansas	4	4	0	South Dakota	1	1	0
Kentucky	6	6	0	Tennessee	10	9	+1
Louisiana	6	6	0	Texas	38	38	0
Maine	2	2	0	Utah	4	4	0
Maryland	9	8	+1	Vermont	1	1	0
Massachusetts	9	9	0	Virginia	12	11	+1
Michigan	13	13	0	Washington	10	10	0
Minnesota	8	8	0	West Virginia	2	2	0
Mississippi	5	4	+1	Wisconsin	8	8	0
Missouri	8	8	0	Wyoming	1	1	0

Table 2: Scenario 2 Results

22. Exhibit 7 shows the calculations of each state's basis of representation after accounting for registration rates. Exhibit 8 shows the resulting basis-of-representation priority values.

C. Scenario 3

23. Table 3 shows the results of Scenario 3, which calculates the basis of representation only for Wisconsin. It loses a seat, and New York gains a seat.

State	Scenario 3 Seats	Census Bureau Seats	Change	State	Scenario 3 Seats	Census Bureau Seats	Change
Alabama	7	7	0	Montana	2	2	0
Alaska	1	1	0	Nebraska	3	3	0
Arizona	9	9	0	Nevada	4	4	0
Arkansas	4	4	0	New Hampshire	2	2	0
California	52	52	0	New Jersey	12	12	0
Colorado	8	8	0	New Mexico	3	3	0
Connecticut	5	5	0	New York	27	26	+1
Delaware	1	1	0	North Carolina	14	14	0
Florida	28	28	0	North Dakota	1	1	0
Georgia	14	14	0	Ohio	15	15	0
Hawaii	2	2	0	Oklahoma	5	5	0
Idaho	2	2	0	Oregon	6	6	0
Illinois	17	17	0	Pennsylvania	17	17	0
Indiana	9	9	0	Rhode Island	2	2	0
Iowa	4	4	0	South Carolina	7	7	0
Kansas	4	4	0	South Dakota	1	1	0
Kentucky	6	6	0	Tennessee	9	9	0
Louisiana	6	6	0	Texas	38	38	0
Maine	2	2	0	Utah	4	4	0
Maryland	8	8	0	Vermont	1	1	0
Massachusetts	9	9	0	Virginia	11	11	0
Michigan	13	13	0	Washington	10	10	0
Minnesota	8	8	0	West Virginia	2	2	0
Mississippi	4	4	0	Wisconsin	7	8	-1
Missouri	8	8	0	Wyoming	1	1	0

Table 3: Scenario 3 Results

24. Exhibit 9 shows the calculations for Wisconsin's basis-of-representation based on its voter registration rates and photo voter ID law. Exhibit 10 shows the resulting priority values.

25. Even removing 300,000 people who were disenfranchised from the apportionment population and recalculating the distribution of seats yields a loss of one seat for Wisconsin and New York gaining one as a result. The priority values calculated for this scenario are tabulated in Exhibit 11. *See also Final Census Apportionment Counts Surprises Many Observers; Raising Questions of Why?*, Table #1 (Apr. 28, 2021), electiondataservices.com/wp-content/uploads/2021/04/NR_Appor20wTablesMaps-20210428.pdf, Ex. 12.

D. Scenario 4

26. Table 4 shows the results of Scenario 4, which calculates basis-of-representation figures for all states based on voter registration rates. It also reflects voter disenfranchisement from Wisconsin's photo voter ID laws. Compared to Scenario 2, Wisconsin loses one seat and Pennsylvania gains one seat.

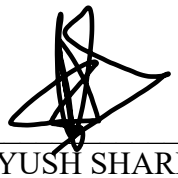
State	Scenario 4 Seats	Census Bureau Seats	Change	State	Scenario 4 Seats	Census Bureau Seats	Change
Alabama	7	7	0	Montana	2	2	0
Alaska	1	1	0	Nebraska	3	3	0
Arizona	10	9	+1	Nevada	4	4	0
Arkansas	4	4	0	New Hampshire	2	2	0
California	49	52	-3	New Jersey	14	12	+2
Colorado	7	8	-1	New Mexico	3	3	0
Connecticut	5	5	0	New York	25	26	-1
Delaware	1	1	0	North Carolina	13	14	-1
Florida	28	28	0	North Dakota	1	1	0
Georgia	14	14	0	Ohio	16	15	+1
Hawaii	2	2	0	Oklahoma	5	5	0
Idaho	2	2	0	Oregon	6	6	0
Illinois	17	17	0	Pennsylvania	18	17	+1
Indiana	8	9	-1	Rhode Island	2	2	0
Iowa	4	4	0	South Carolina	6	7	-1
Kansas	4	4	0	South Dakota	1	1	0
Kentucky	6	6	0	Tennessee	10	9	+1
Louisiana	6	6	0	Texas	38	38	0
Maine	2	2	0	Utah	4	4	0
Maryland	9	8	+1	Vermont	1	1	0
Massachusetts	9	9	0	Virginia	12	11	+1
Michigan	13	13	0	Washington	10	10	0
Minnesota	8	8	0	West Virginia	2	2	0
Mississippi	5	4	+1	Wisconsin	7	8	-1
Missouri	8	8	0	Wyoming	1	1	0

Table 4: Scenario 4 Results

27. Exhibit 13 shows the calculations for each state's basis of representation, which accounts for each state's voter registration rates and for Wisconsin's photo voter ID law. Exhibit 14 shows the resulting priority values.

28. I declare under penalty of perjury that the foregoing is true and correct.

Executed on 01/12/22.



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