

Geospatial Analysis Portfolio

Katherine M. Yut

Friday, August 25, 2023

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Cover Letter

Dear NASA,

I am writing to express my interest in the Program Scientist position at NASA and outline my qualifications, which firmly position me as an outstanding potential team member. With a background in data wrangling, geospatial analysis, and the art of data visualization, I possess strong problem-solving abilities coupled with a knack for coding, making me an ideal candidate for data-driven endeavors.

During my tenure as a GIS & Energy Data Analyst at the University of Texas, Bureau of Economic Geology, I have honed comprehensive skills in GIS, coding, and effective communication. My track record includes successfully utilizing tools such as ArcMap and R to perform intricate subsurface research, develop peer-reviewed literature, and present findings.

My experience as a Viticulture Research GIS Intern at E. & J. Gallo Winery has equipped me with the proficiency to manage large datasets, automate satellite data acquisition, and employ statistical techniques to drive decision-making. Collaborating with cross-functional teams, I contributed to optimizing wine grape yield and quality through informed irrigation strategies, solidifying my dedication to translating data into impactful solutions.

While a remote sensing intern with NASA DEVELOP, I conducted thorough literature reviews, collected training data, deployed classification models, and performed site suitability analyses. My role demanded a keen eye for design as I created compelling visuals while ensuring adherence to stringent style guidelines. I excelled at developing workflows using ArcGIS, ENVI, Idrisi Terrset, and Google Earth Engine despite unforeseen challenges. Thriving in a collaborative environment, my team and I effectively communicated complex scientific concepts to both technical and non-technical audiences.

My educational background, consisting of a Master of Arts in Economics and Big Data, a Bachelor of Arts in Economics and Big Data, and a Bachelor of Science in Geographic Information Science, demonstrates my curiosity, rapid learning capability, and unwavering commitment to acquiring expertise across domains. My skill set includes RStudio, R, ESRI ArcMap, QGIS, Google Earth Engine, ENVI, GitHub, Java, JavaScript, SQL, and Python.

Driven by a genuine passion for data analysis, I am eager to contribute my insights, skills, and efficiency to the team. Thank you for considering my application. I look forward to the opportunity to discuss how my experiences align with your vision during an interview.

Best,



Katherine (Katy) Yut

Katherine M. Yut

Geospatial Data Analyst

Expert in geospatial and statistical analyses using R. Passionate about data visualization. Seeking to solve interesting problems while growing geospatial Python skills.

Work History

2022-05 – GIS & Energy Data Analyst

Current University of Texas, Bureau of Economic Geology, *Austin, TX*

- **Analyzing (50%):** Utilizing ArcMap to aid in oil & gas research.
- **Coding (40%):** Leveraging R to clean and manipulate data tables, solve problems, and draw conclusions.
- **Communicating (10%):** Publishing research findings as papers, posters, and presentations.



2020-06 – Viticulture Research GIS Intern

2020-12 E. & J. Gallo Winery, *Modesto, CA*

- **Coding (35%):** Managed expansive file structure and folder organization; automated data acquisition using R.
- **Analyzing (35%):** Processed/analyzed data; built multivariate linear model; completed remote sensing analysis in Google Earth Engine.
- **Storytelling (25%):** Assisted with irrigation decisions to improve wine grape yield and quality; presented findings in slideshow.
- **Fieldwork (5%):** Assisted with Trimble GPS in situ data collection, berry sampling, and other vineyard tasks.



2019-05 – Remote Sensing Intern

2019-08 NASA DEVELOP, *Pocatello, ID*

- **Solo research (30%):** Conducted literature review; collected training data, built classification models, completed site suitability analyses.
- **Visualizations (30%):** Designed figures, maps, and slideshows; adhered to strict style guidelines.
- **Team research (20%):** Brainstormed; collaborated; developed workflow in ArcGIS, ENVI, Idrisi Terrset, and Google Earth Engine; delegated tasks; tackled unexpected setbacks.
- **Communication (20%):** Wrote tutorial to reproduce workflow; collaborated with partners; conveyed complex science to lay audience.



Research

2019-04 Kelley, S., Yut, K., Kulkarni, R., & Gaffin, D. (2019). Avoidance of rosemary oil by scorpions. *Journal of Arachnology*.



Education

2016-08 – Master of Arts: Economics and Big Data

2021-05 Bachelor of Arts: Economics and Big Data

Bachelor of Science: Geographic Information Science

University of Oklahoma – Norman, OK

Summa cum laude

Contact

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linkedin.com/in/katherine-yut/

Skills

RStudio, R: Writing functions, making packages, documenting code; Programming interactive html servers with responsive graphics using R shiny.



ESRI ArcMap



QGIS, Google Earth Engine, ENVI, GitHub, Java, JavaScript



Big Data statistical processing, analysis, and modeling



SQL, Python



Statistics; Quality control and multivariate normality checks; Principal Components, Factor, and Bayesian analyses; Ordinary and weighted least squares linear regression.



Creating timely deliverables and communicating effectively



Curiosity, organization, multitasking, and focus



Recognition

- Phi Beta Kappa Honor Society
- Outstanding Junior
- National Merit Scholar Finalist

References

The following individuals are happy to vouch for my character and data analysis capabilities:

1. Katie Smye
Bureau of Economic Geology | Research Associate
katie.smye@beg.utexas.edu | (512)-471-6775
2. Brent Sams
E. & J. Gallo Winery | Research Scientist
sams.brents@gmail.com | (209) 568-9317
3. Kirsten de Beurs
Wageningen University | Chair & Professor
kdebeurs@gmail.com | +3 (131) 748-2219

Sample Work

Bureau of Economic Geology

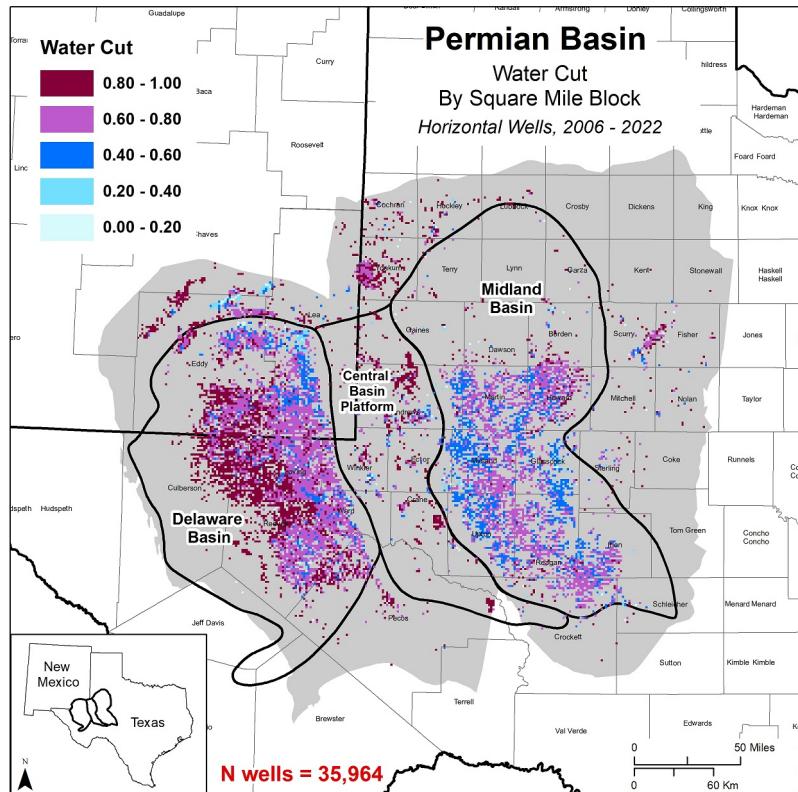


Figure 1: Map of Water Cut (Produced Water / Produced Oil + Produced Water) for all horizontal wells in the Permian Basin, aggregated on square mile blocks. Created in ArcMap using data from IHS Enerdeq.

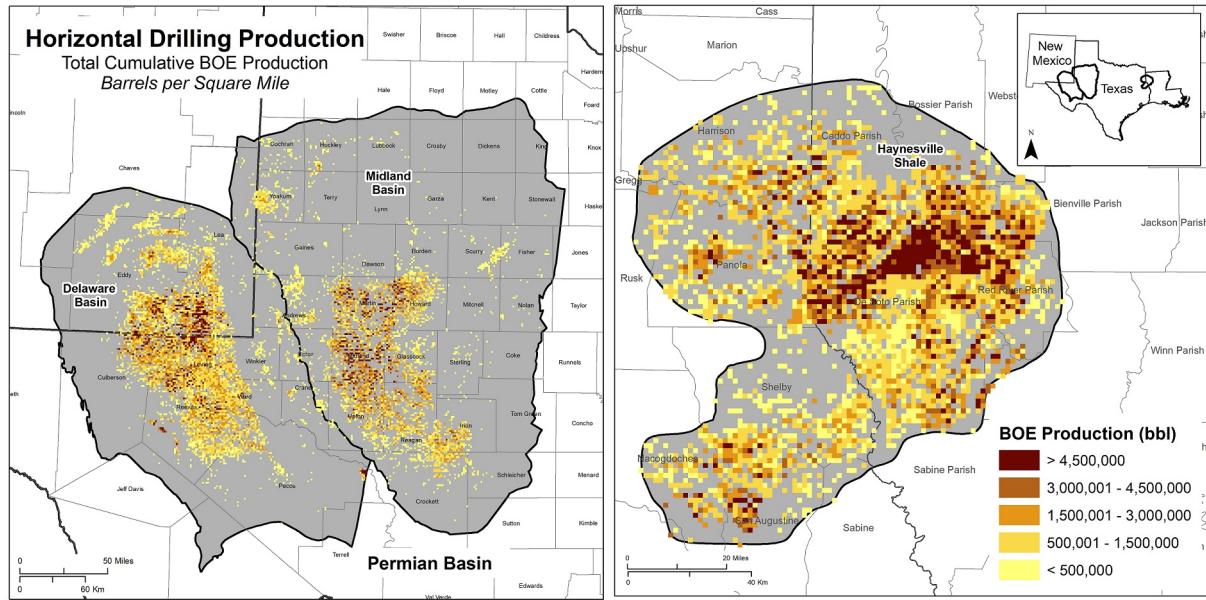


Figure 2: Map of total cumulative production of oil and gas production, in barrels of oil equivalent, for all horizontal wells in Delaware, Midland, and Haynesville, aggregated on square mile blocks. Created in ArcMap using data from IHS Enerdeq.

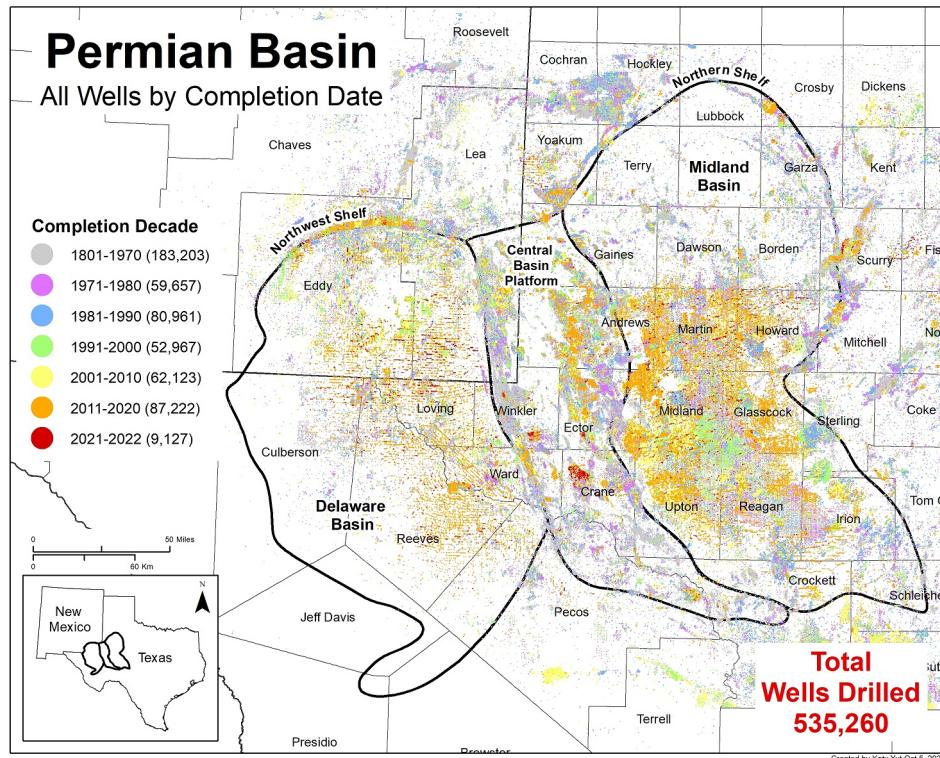


Figure 3: Map of all wells drilled in the Permian Basin region, colored by decade completed. Created in ArcMap using data from IHS Enerdeq.

Internships

E&J Gallo Winery (2020)

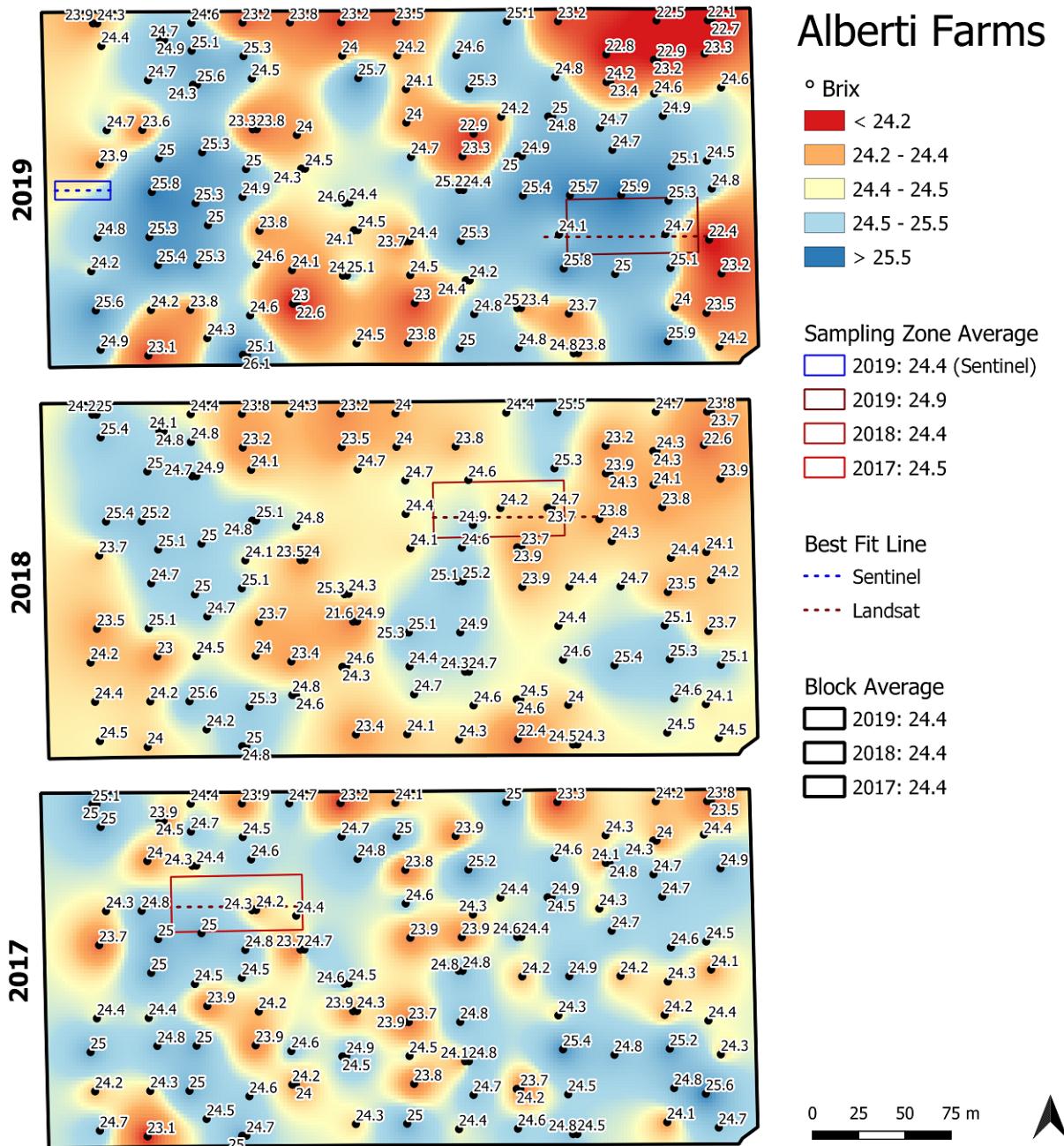


Figure 4: Kriging interpolated Brix (i.e., grape sugar content) values for 2017, 2018, and 2019 across a single block with sampling algorithm solutions for both Landsat and Sentinel imagery. Created in QGIS.

NASA DEVELOP (2019)

Forecasting Red Spruce Restoration Using NASA Earth Observations to Support Decision Making in the USFS Monongahela National Forest

ABSTRACT: In the Monongahela National Forest (MNF), situated in the Allegheny Highlands of West Virginia, extensive logging and mining practices have significantly altered the structure and composition of flora and fauna over the past two centuries. To aid red spruce restoration, this study mapped current and historical stands and identified non-native stands... [Read full abstract here.](#)

Monongahela National Forest Red Spruce LULC 2018 to 2040

National Aeronautics and Space Administration

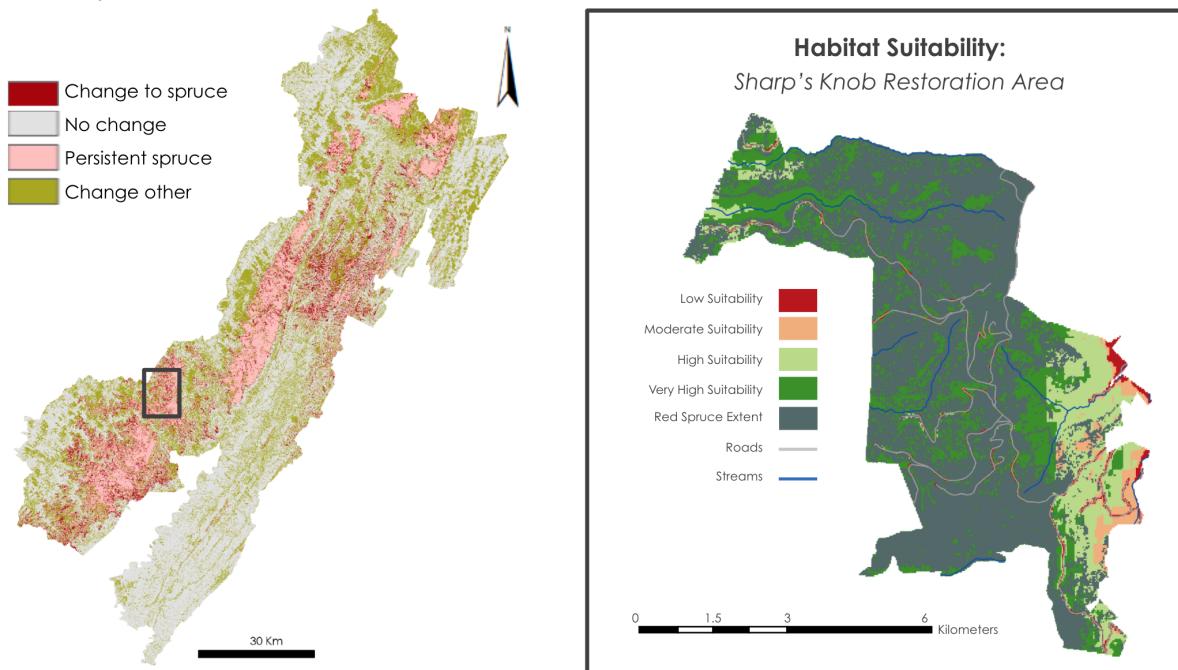


Figure 5: Land classification change using Classification Tree Algorithm in Idrisi Terrset (left). Site suitability analysis created in ArcMap (right).

Relevant Coursework

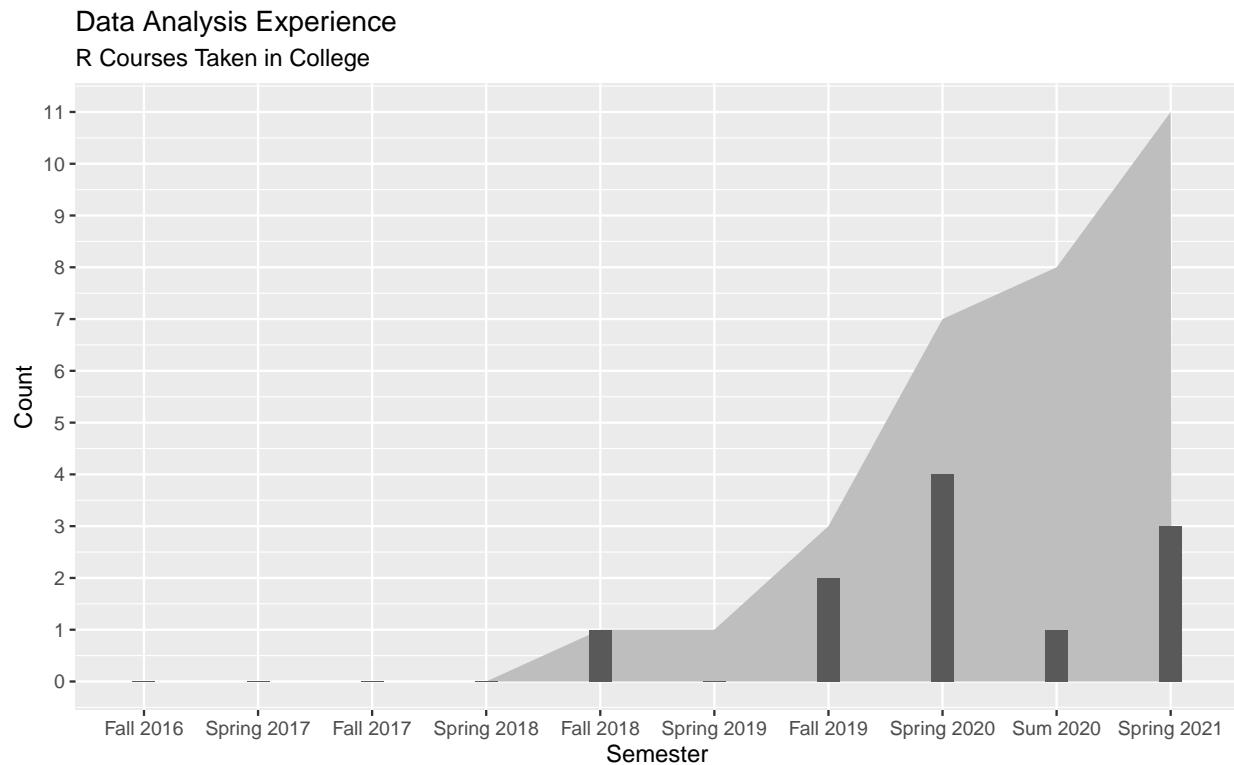


Figure 6: Time series by semester showing cumulative (light grey) and count (dark grey) of RStudio data science classes taken. Created in RStudio using ggplot2.

Course Name	Grade	Semester
Econometrics	A	Fall 2018
Spatial Statistics	A	Fall 2019
Stats for Decision Making	A	Fall 2019
Advanced GIS/Spatial Analysis	A	Spring 2020
Managerial Econ II	A	Spring 2020
Geoinformatics Capstone Seminar	A	Spring 2020
Bayesian Econometrics	B	Spring 2020
Intro to Math Stats	A	Summer 2020
Text Analytics	A	Spring 2021
Advanced Applied Stats	A	Spring 2021
Research in Economic Problems	Pass	Spring 2021

Table 1: Table of each RStudio data science class and the grade earned. Created in RStudio using kableExtra.