

Geospatial Analysis Portfolio

Katherine M. Yut

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Cover Letter

Austin, TX 78704

Dear NASA,

I am writing to express my strong interest in the Program Scientist position. This document contains my resume, references, and an overview of my geospatial analysis experience. More information can be found at the relevant links, and I am reachable on [LinkedIn](#) or via email.

As a past DEVELOPer, motivated problem-solver, clear communicator, and quick learner, I embody many of the traits NASA is looking for in an ideal candidate. Additionally, I have ample experience navigating quantitative analyses and am familiar with a variety of platforms, languages, and software, such as R, ESRI ArcGIS, Google Earth Engine, QGIS, ENVI, SQL, and Python. I am passionate about visualizing data, solving complex problems, and promoting sustainability.

I earned three degrees in less than five years, as evidence of my curiosity and ability to learn quickly. During my college career, I was also able to complete two formative internships: the first, a 10-week stint with NASA through the DEVELOP program, and the second, six months at E. & J. Gallo Winery. Most recently, I have been working for the Bureau of Economic Geology as a GIS Energy Analyst, completing projects in R and ArcMap to aid in energy and geology research. Ideally, I am looking for another opportunity with a challenging, collaborative environment that will further develop my geospatial analysis skills.

Many of these skills were honed throughout my Geographic Information Science capstone. For this research project, I assisted with the initial stages of a [much larger research effort](#) studying the spread of zoonotic diseases in Central Asia, specifically along China's Belt and Road Initiative. My project developed a methodology for classifying the land use and land change in Tashkent, Uzbekistan, using spatiotemporal data in Google Earth Engine and RStudio. This methodology will be used to study the wildland-urban interface (WUI) and potential disease spread.

Thank you for your time and consideration. It is my sincere hope that you get a sense for my commitment to geospatial analysis and creative, effective visualization. While the following document contains a representative sample of the relevant work I have done in the past, it is by no means a comprehensive account of who I am. I look forward to further discussing the position in the near future!

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

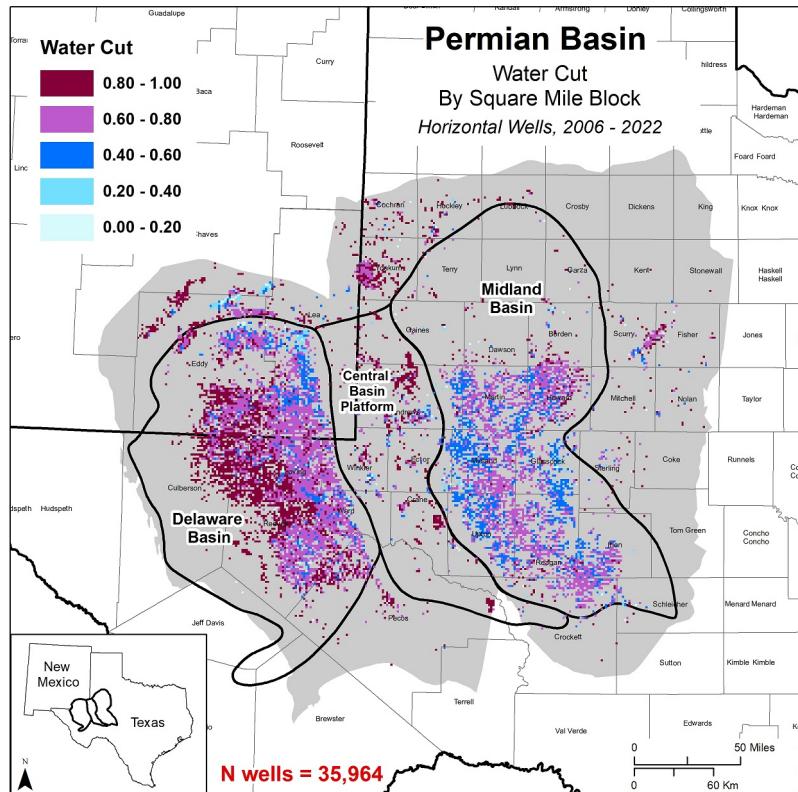


Figure 1: Map of Water Cut (Produced Water / Produced Oil + Produced Water) for all horizontal wells in the Permian Basin, aggregated on square mile blocks. Created in ArcMap using data from IHS Enerdeq.

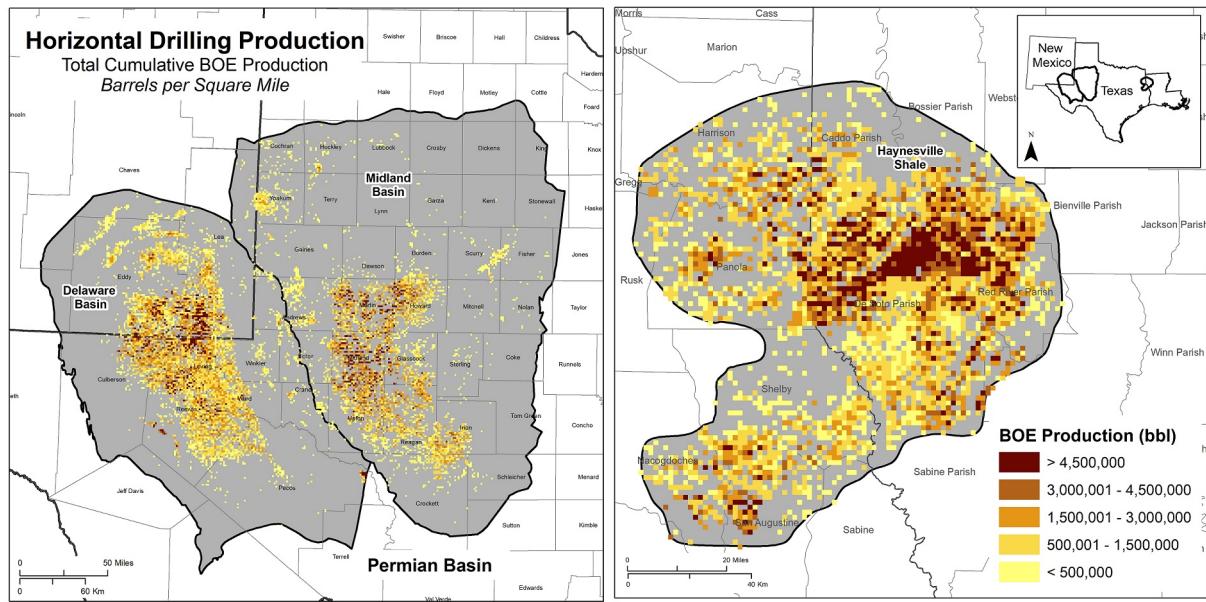


Figure 2: Map of total cumulative production of oil and gas production, in barrels of oil equivalent, for all horizontal wells in Delaware, Midland, and Haynesville, aggregated on square mile blocks. Created in ArcMap using data from IHS Enerdeq.

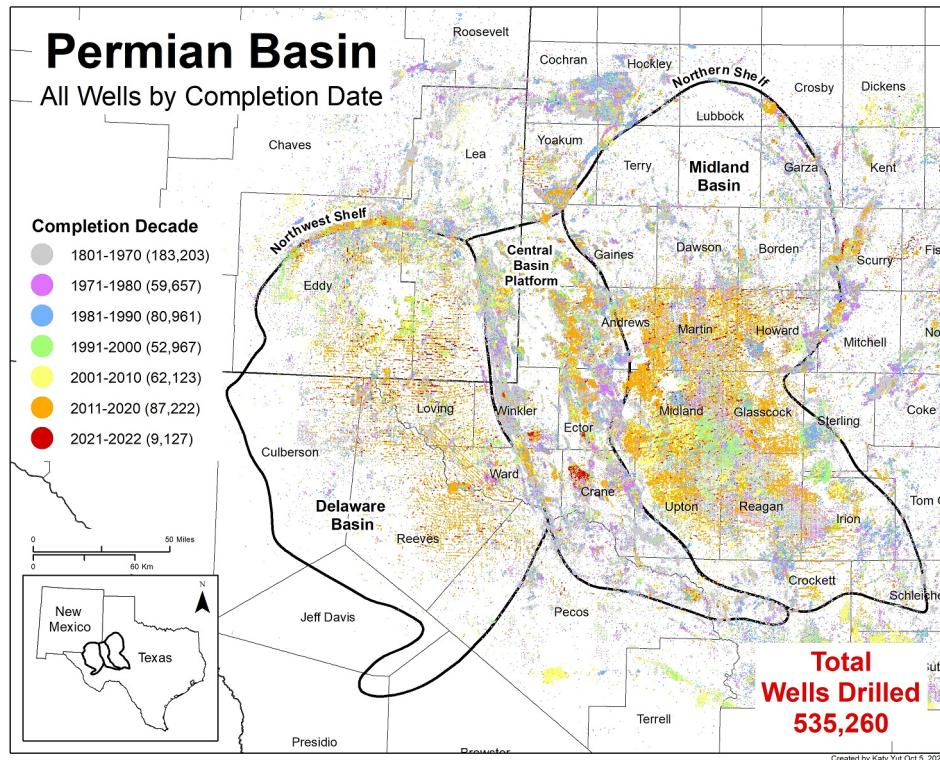


Figure 3: Map of all wells drilled in the Permian Basin region, colored by decade completed. Created in ArcMap using data from IHS Enerdeq.

Internships

E&J Gallo Winery (2020)

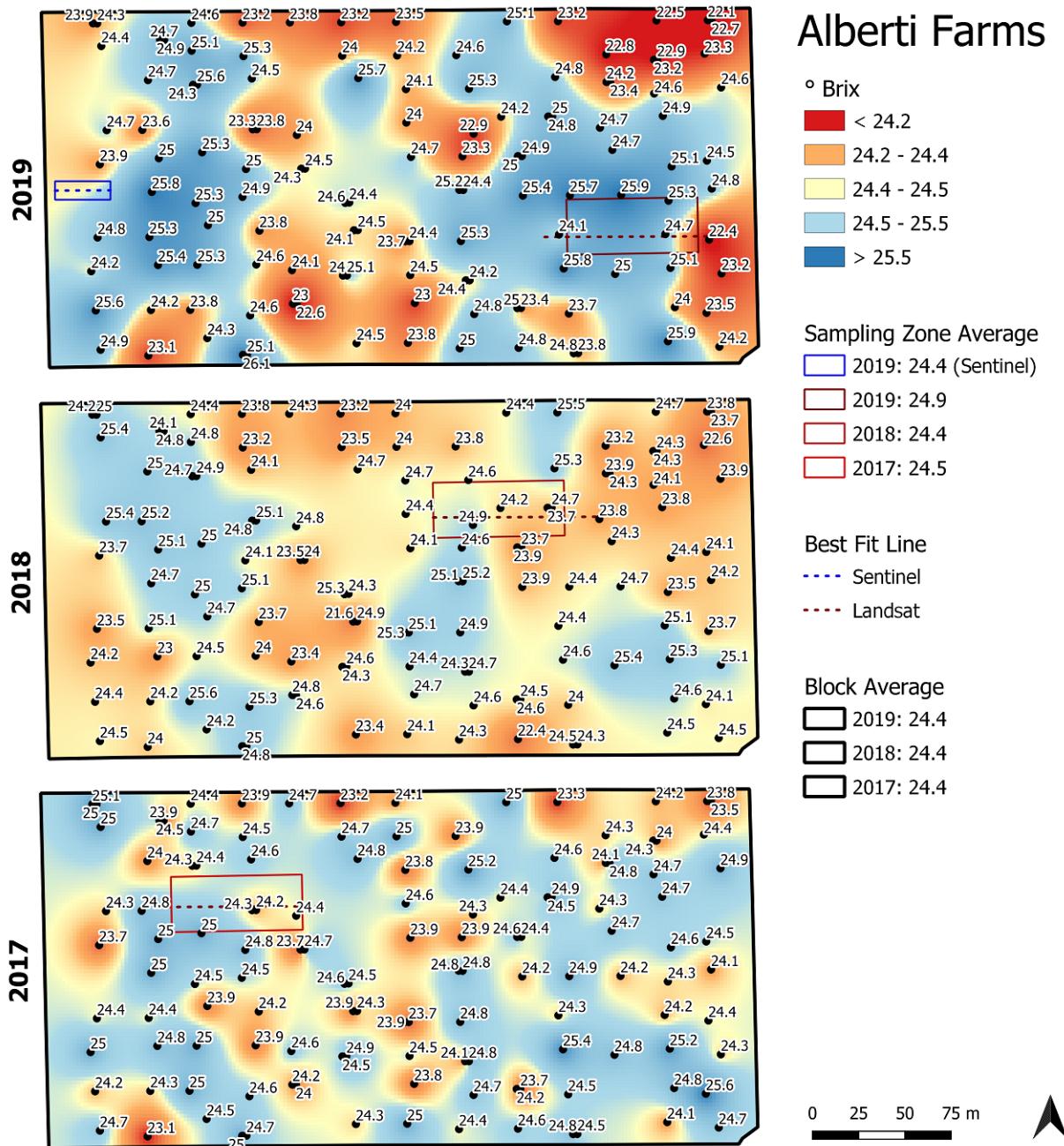


Figure 4: Kriging interpolated Brix (i.e., grape sugar content) values for 2017, 2018, and 2019 across a single block with sampling algorithm solutions for both Landsat and Sentinel imagery. Created in QGIS.

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

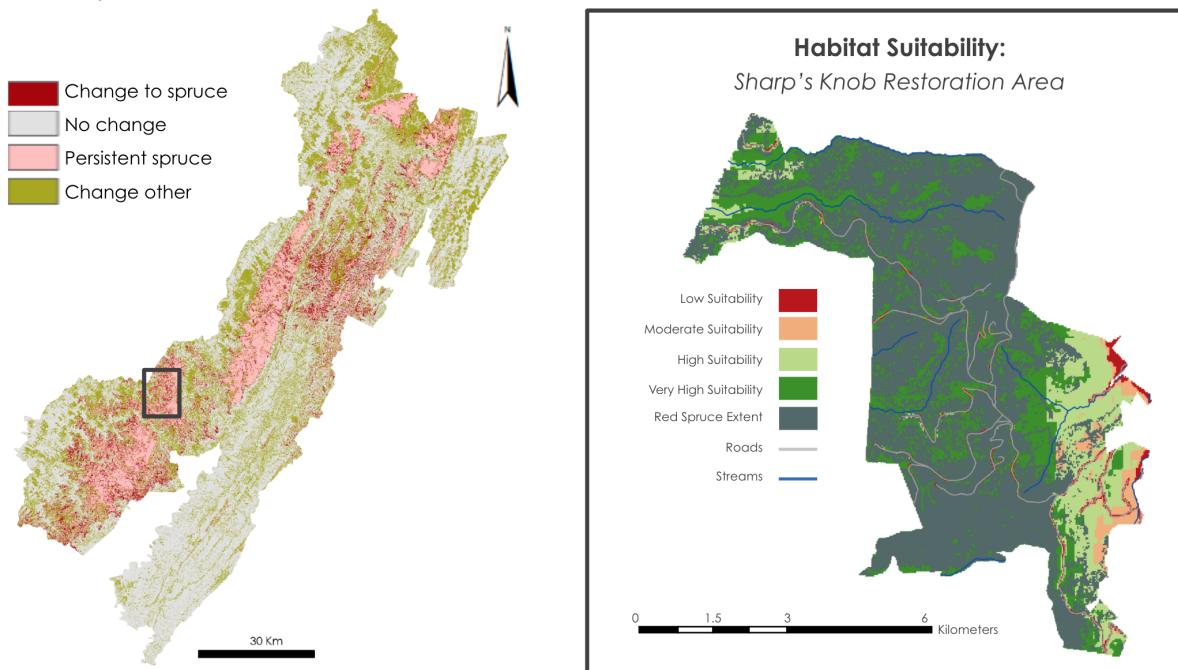


Figure 5: Land classification change using Classification Tree Algorithm in Idrisi Terrset (left). Site suitability analysis created in ArcMap (right).

Relevant Coursework

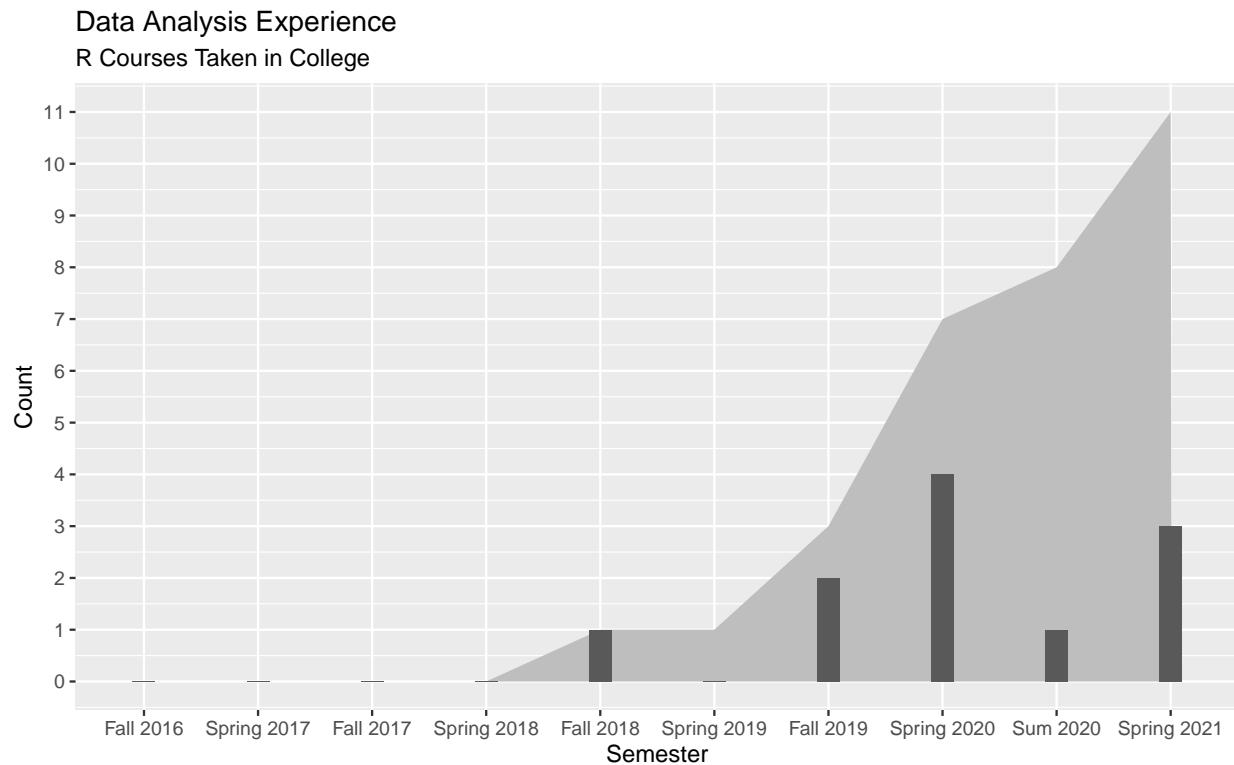


Figure 6: Time series by semester showing cumulative (light grey) and count (dark grey) of RStudio data science classes taken. Created in RStudio using ggplot2.

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.