

UIUC - MENG

PORTFOLIO

By Wan Yin Chen

Driving Innovation at the
Intersection of Engineering, Data,
and Technology



2025

About Me

I am a law graduate from National Taiwan University with a year of experience exploring the intersection of law and technology. Over the past year, I have honed my skills through a variety of projects, research, and self-learning, gaining experience in machine learning, NLP, and data visualization.

As I prepare to join the **UIUC's MEng program**, I aim to deepen my expertise in scalable systems, distributed computing, and advanced analytics. By engaging in coursework in Statistical Learning Theory, ML, Distributed Algorithms, and Data Science Analytics, I will further refine my technical skills and develop innovative solutions to tackle real-world challenges. The MEng program's focus on interdisciplinary learning, applied problem-solving, and societal impact aligns seamlessly with my long-term goal of designing transformative systems that bridge the gap between technology and societal needs.

- **github link:**

<https://github.com/wyinchen/CS-DS-Portfolio>

- **Resume**
-

- **Languages:** Python, C++, R, SQL, JavaScript
- **Frameworks/Tools:** Tableau, HTML/CSS, TF-IDF
- **Techniques:** Machine Learning, Data Visualization, Statistical Analysis, Web Scraping, Text Mining

Academic & Technical Foundations

Self-Learning: LeetCode Practice

- Solved 92 problems in one month, focusing on:
- Advanced: Dynamic Programming, Backtracking, Divide and Conquer.
- Intermediate: Trees, Binary Trees, Hash Tables.
- Fundamental: Arrays, Strings, Two Pointers, Matrices.
- Profile: [LeetCode](#)

Related Coursework

National Taiwan University (NTU)

29 credits with an average GPA of 4.11 / 4.3

- Programming for Data Science (A)
- Programming and Web Scraping (A)
- Computer Programming in Python (A-)
- Digital Decision Making: Data Visualization and Machine Learning (A+)
- Text Analysis with Python (A)
- Statistical Learning (A+)
- Calculus (General Mathematics I & II) (A+, A+)
- Introduction to Computer Science (A+)
- Seminar on Legal Analytics (A)
- Digital Intelligent Court & Empirical Legal Studies (A)

National Taiwan Normal University (NTNU) [TRANSCRIPTS](#)

12 credits, Non-Degree Academic Coursework

- Data Structures (A+)
- Object-Oriented Programming (A+)
- Linear Algebra (B+)
- Statistics (A+)

Experience

Research

- Empirical Research on Guardianship Declaration in Taiwan

Awards

- Second Place, Taiwan's Legal Tech Hackathon
- Honorable Mention, National Humanities Big Data Competition
- Bachelor's Thesis Award, National Taiwan University

Technical Projects

Course Projects

- Price Comparison Platform
- Defamation Ruling Analysis for Civil Damage Compensation Prediction
- Drunk Driving Fatality Sentencing Analysis
- Examination Essay Sample Analysis

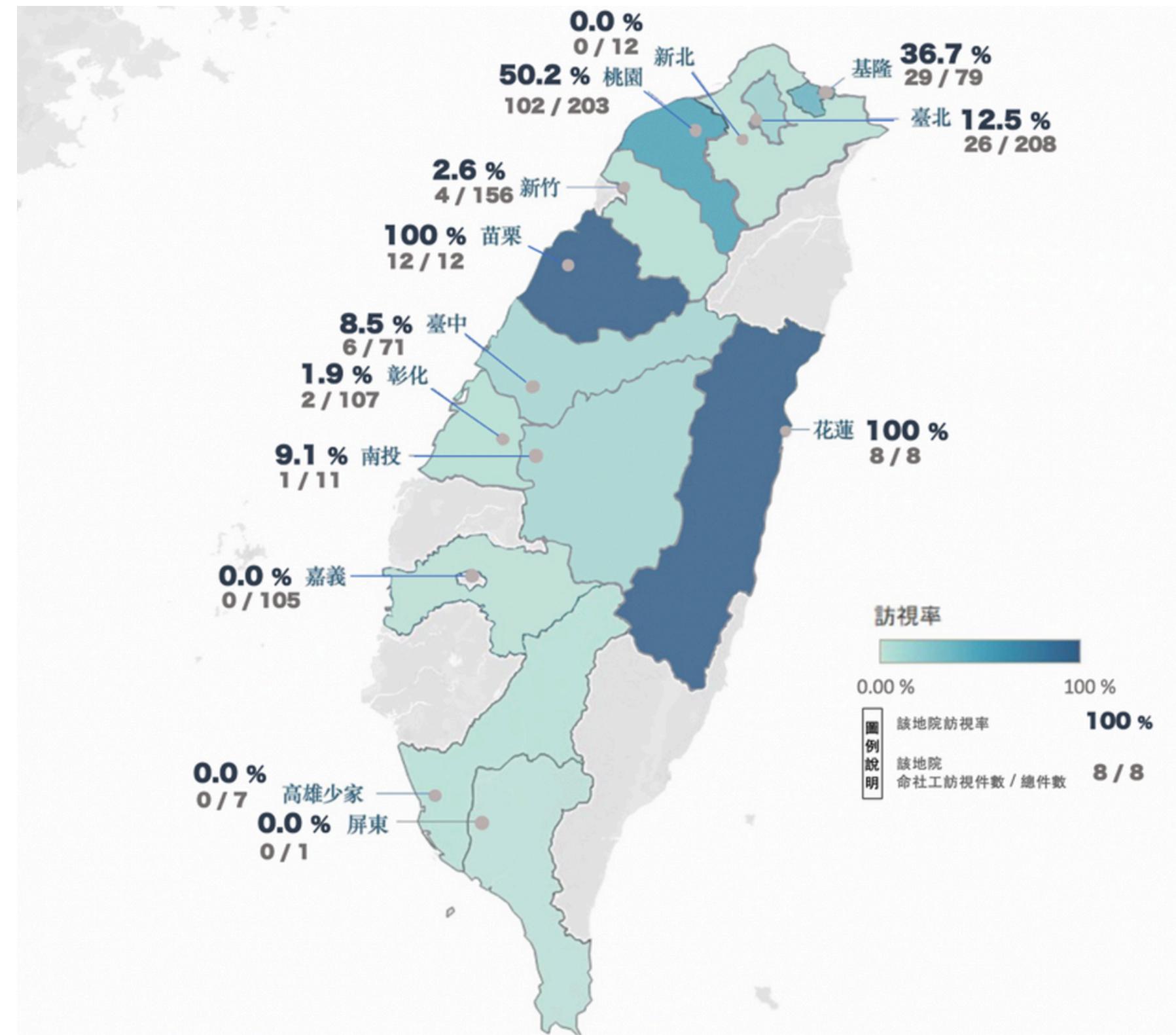
Competitions

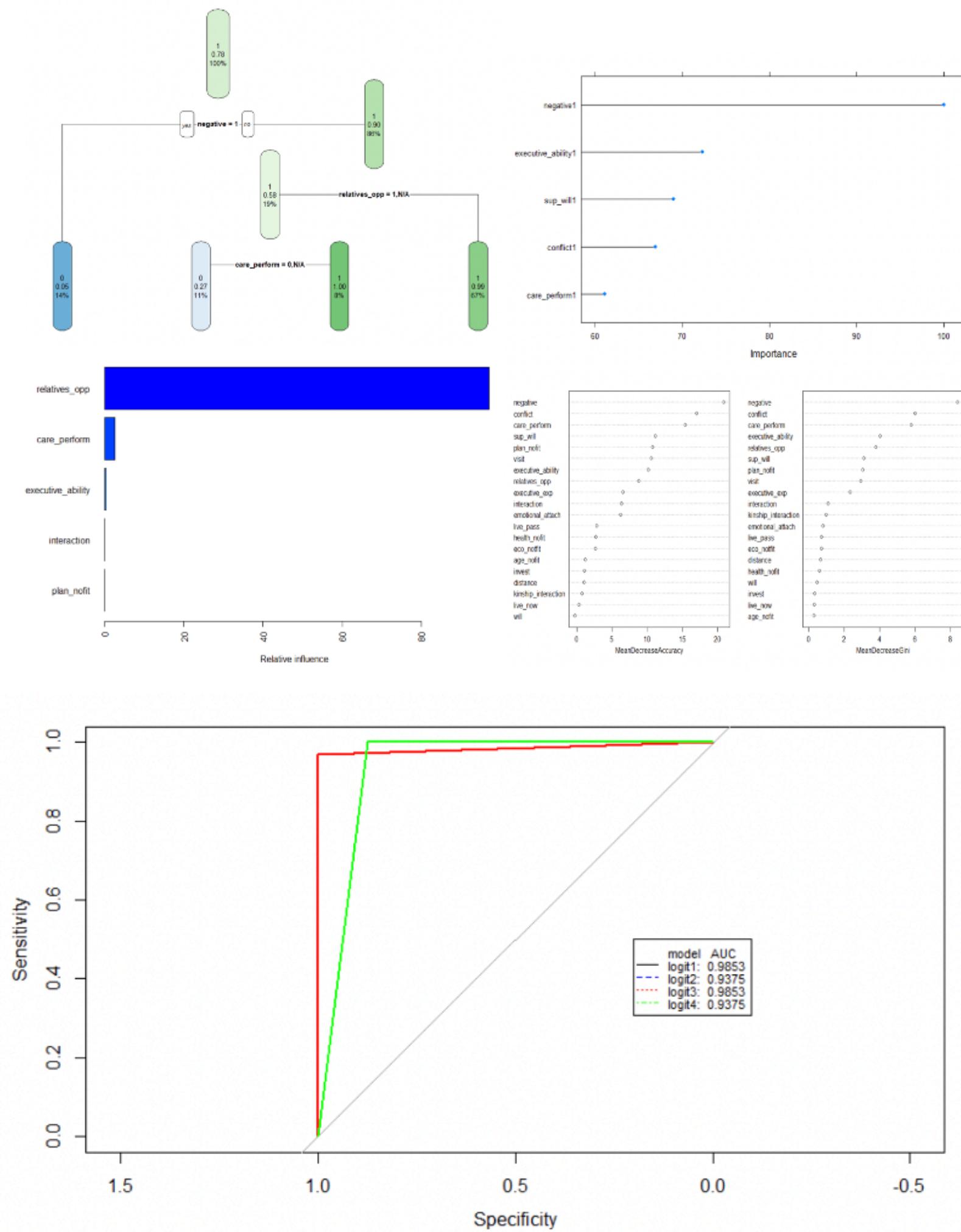
- AI-Assisted Judgment System for Jury Decision Support
(Legal Tech Hackathon)
- Compensation Prediction System for Marital Rights Violation Cases
(National Humanities Big Data Competition)

Empirical Research on Guardianship Declaration in Taiwan

Undergraduate Research Fellowship, National Science
and Technology Council (NSTC), Taiwan

- Advisor: Prof. Sieh-Chuen Huang
- Honor: NTU Undergraduate Thesis Excellence Award
- Publications:
 - Huang, S.-C., & Chen, W.-Y. (2023). An empirical study on the applications for guardianship declarations. Court Case Times, 129, 99–110.
 - Huang, S.-C., & Chen, W.-Y. (2023). An empirical study on the factors influencing court-appointed guardianship in Taiwan. Court Case Times, 136, 104–117.





- **Research Focus**

Analyzed 1,155 guardianship cases in Taiwan (2009-2021), focusing on judicial selection logic in 171 cases with multiple candidates.

- **Techniques**

Applied machine learning models (e.g., decision trees, random forests, GBM), logistic regression, and data visualization techniques to identify key decision factors and streamline analysis

- **Outcomes**

Achieved 90.9% prediction accuracy with an AUC of 0.9423, providing actionable insights to enhance transparency and efficiency in legal decision-making processes

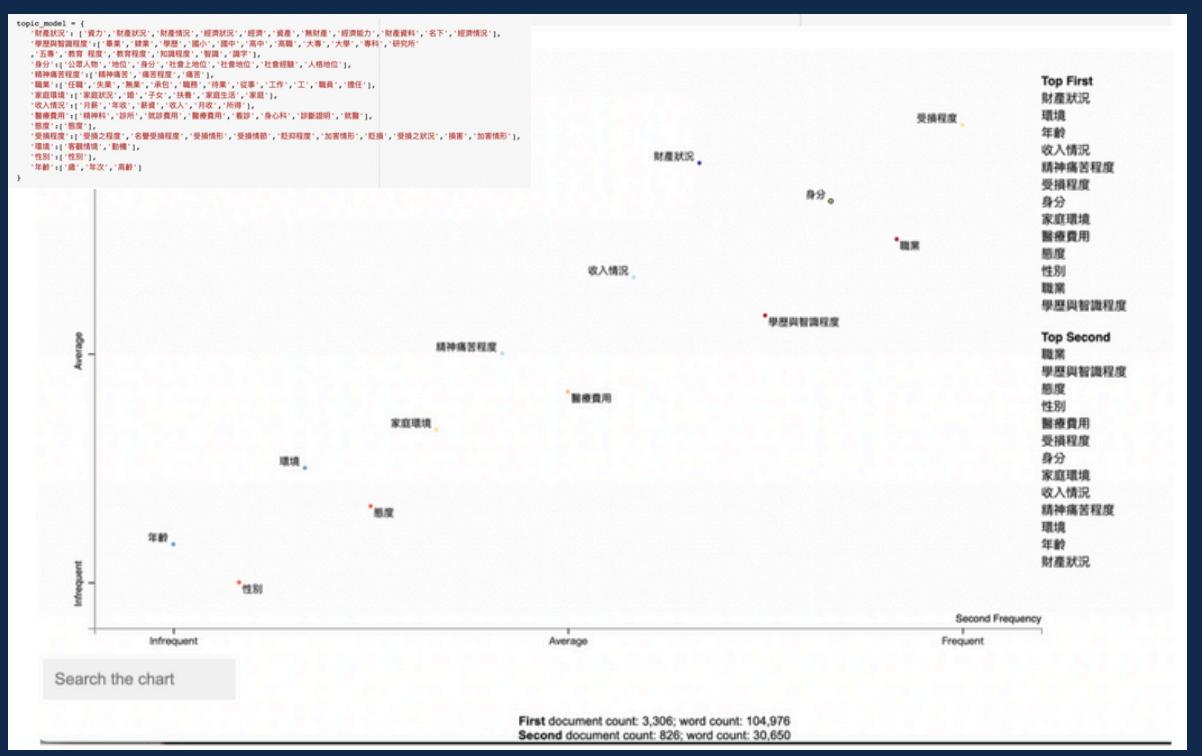
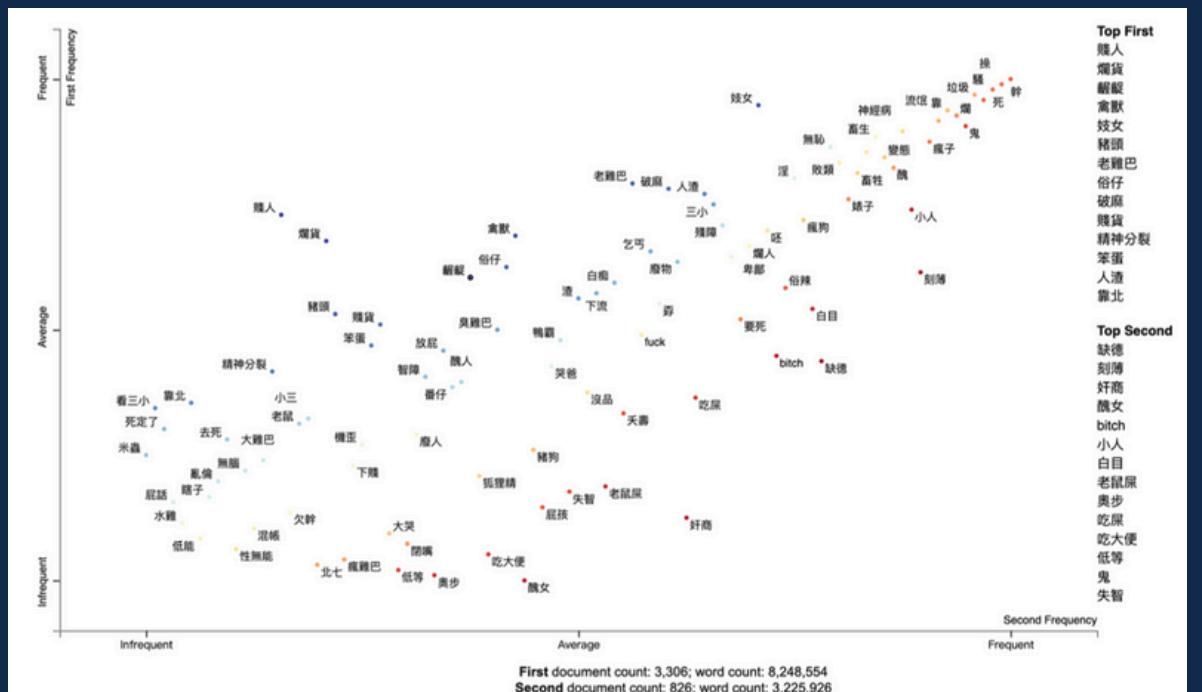
Price Comparison Platform (Shopping Website Scraping)

- **Course:** Programming and Web Scraping
- [Github](#)
 - power point
 - [Presentation Video](#)
- **Objective**
 - Simplify the price comparison process for online shopping by creating a tool that automates product price ranking and optimizes coupon application.
- **Key Features**
 - Extracted product data and coupon information from Shopee using Python and web scraping techniques.
 - Designed a GUI interface using Tkinter for user-friendly interaction.
 - Implemented backend algorithms to rank product prices, accounting for shipping costs and discount applications.
- **Impact**
 - Enabled users to make real-time, efficient price comparisons.
 - Reduced manual effort by automating data collection and sorting processes.
- **Technologies Used**
 - Programming: Python, Asyncio, Requests
 - Tools: Tkinter, JSON for data formatting



Defamation Ruling Analysis for Civil Damage Compensation Prediction

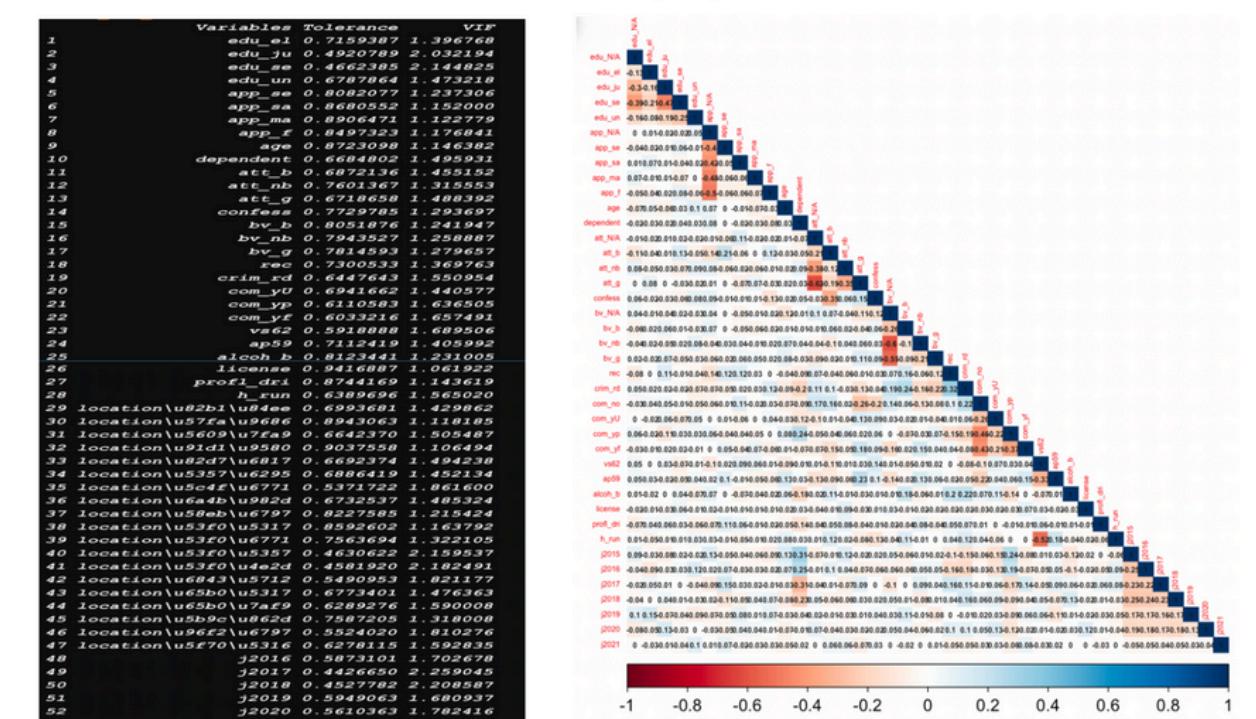
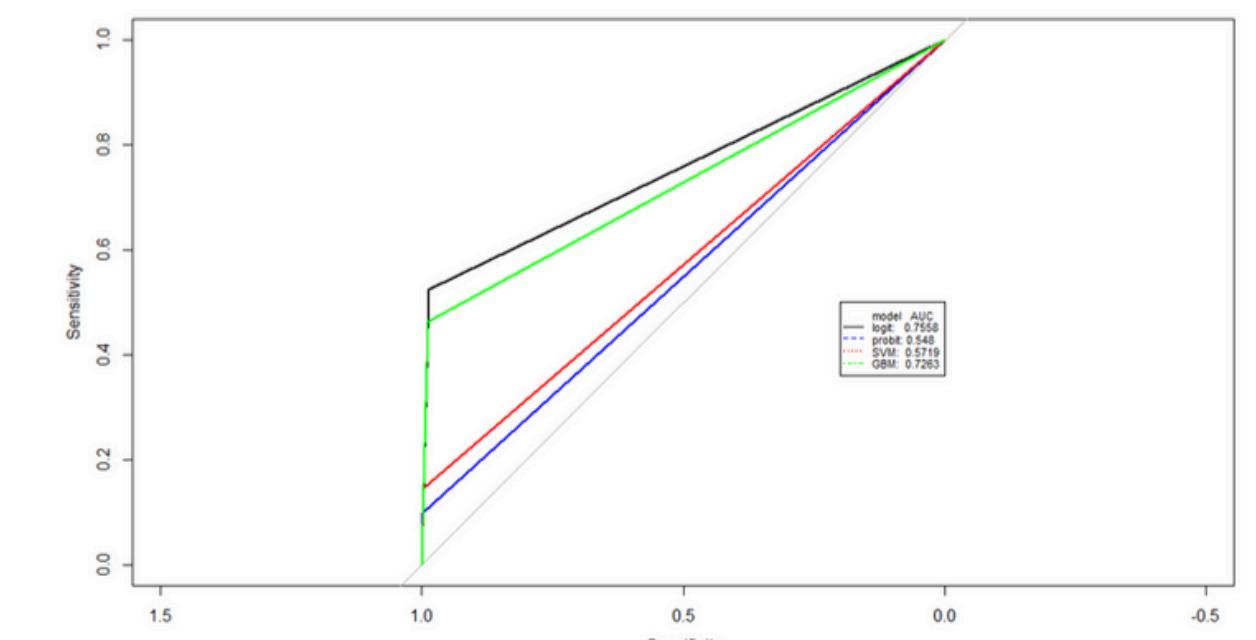
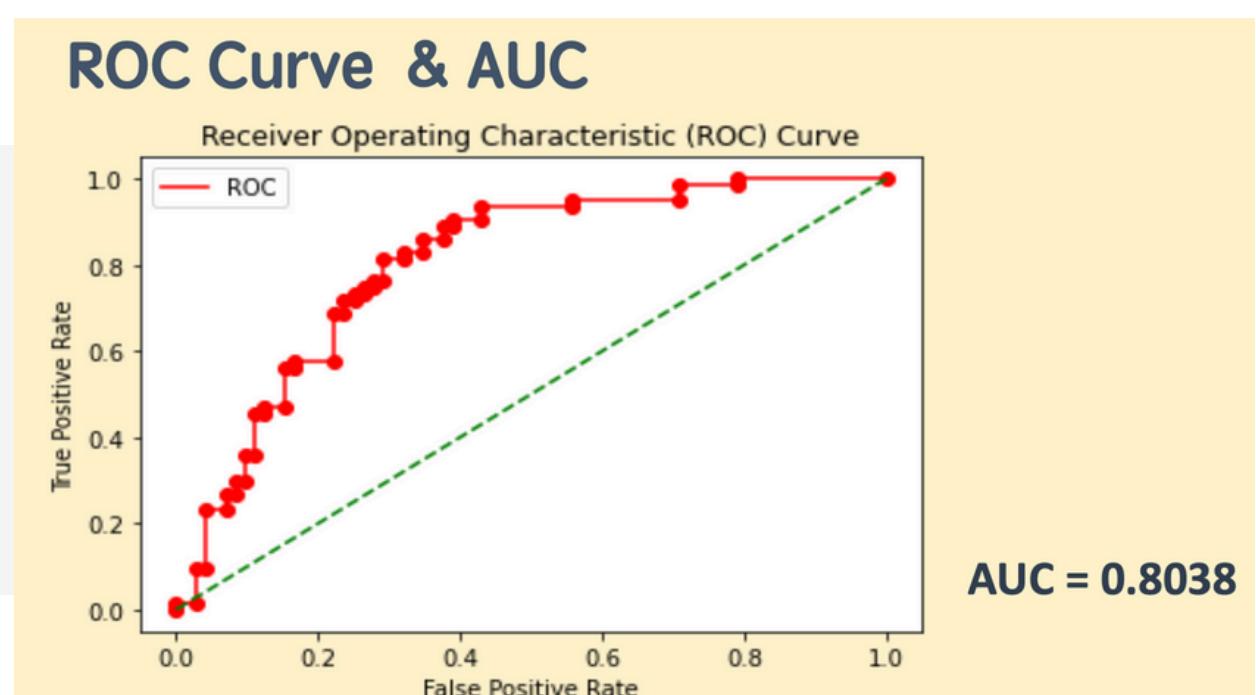
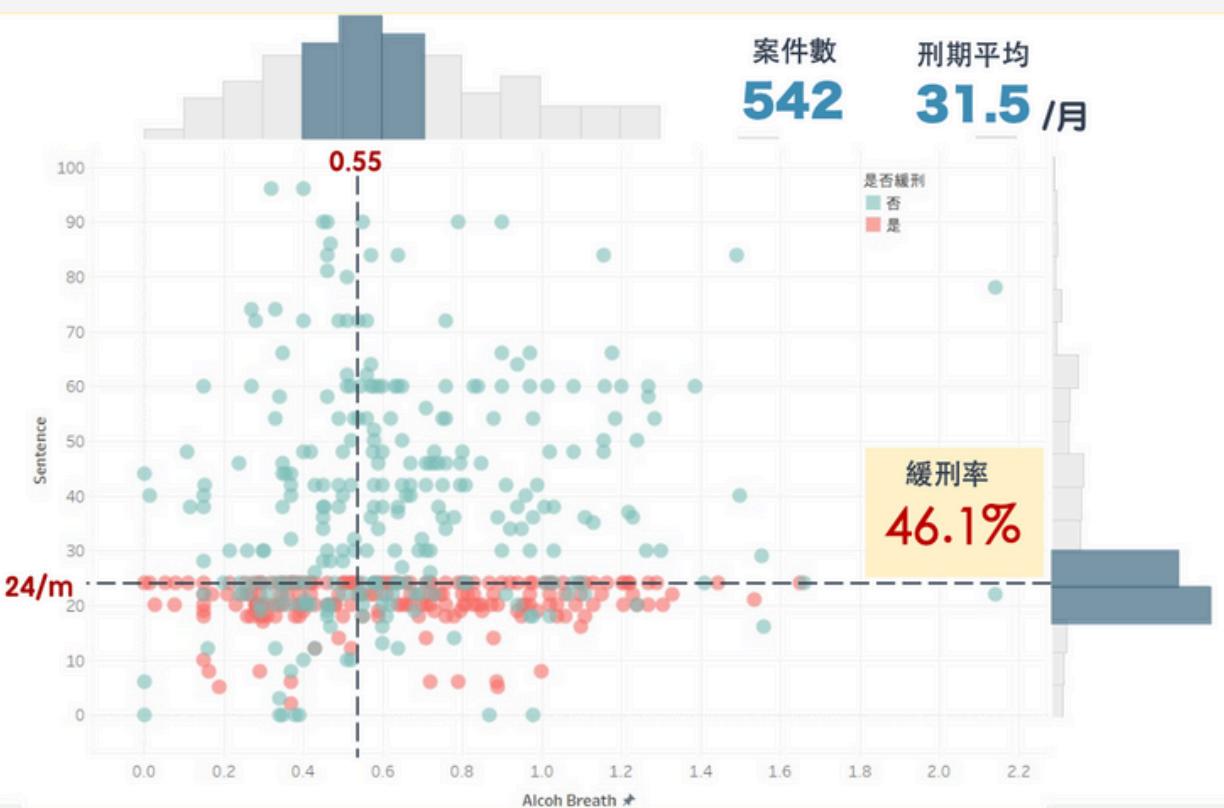
- **Course:** Text Analysis with Python
- **Github**
 - power point
 - Term project
 - Dynamic Charts
- **Objective** To analyze defamation rulings in Taiwan's district courts (2008–2018), evaluate compensation patterns
- **Key Features**
 - Collected and analyzed 4,132 court rulings, focusing on compensation amounts and frequently litigated terms.
 - Applied Natural Language Processing (NLP) to extract and rank derogatory terms by frequency and legal relevance.
- **Impact**
 - Identified regional inconsistencies in damage awards, supporting judicial standardization.
 - Revealed biases in the "Insult Pricing Table," advocating data-driven improvements.
 - Improved transparency to inform policymakers and legal professionals.
- **Technologies Used**
 - Python: For web scraping, data preprocessing, and analysis.
 - NLP Techniques: Used TF-IDF to rank defamatory terms.
 - Tableau: To visualize regional trends and disparities in court rulings.
 - Statistical Analysis: Applied to validate compensation patterns.



Drunk Driving Fatality Sentencing Analysis

- **Courses:** Seminar on Legal Analytics, Data Visualization and ML, Statistical Learning
- **Github**
 - [Digital Humanities and Legal Analytics Educational Webpage](#): [term project](#)
 - Term projects
- **Objective** Analyze the sentencing factors influencing drunk driving fatality cases in Taiwan to identify judicial trends and factors affecting probation rulings, providing insights for legal practitioners and policymakers
- **Key Features**
 - Developed structured datasets from 542 court rulings (2015–2021) using web scraping and data preprocessing.
 - Utilized linear regression to identify factors impacting sentencing length, such as alcohol concentration and post-offense behavior.
 - Constructed logistic regression models to predict probation likelihood, focusing on variables like compensation, criminal history, and judicial region.
- **Impact**
 - Identified inconsistencies in sentencing practices and probation rulings across regions.
 - Offered data-driven recommendations for improving sentencing transparency and equity.
 - Contributed tools and insights to enhance judicial policy evaluation and public communication.
- **Technologies Used**
 - Data Processing & Analysis: Python, R
 - Visualization: Tableau
 - ML & Statistical Modeling: MLP, Decision Trees, and Linear and Logistic Regression Techniques

Drunk Driving Fatality Sentencing Analysis



Examination Essay Sample Analysis

- **Course:** programming for data science
- **Github**
 - [term project website](#)
 - Term project
- **Objective** To analyze patterns and qualities in high-achieving essays from Taiwan's university entrance exams, aiming to understand the linguistic and structural elements that contribute to their success
- **Key Features**
 - Transcribed and standardized 208 handwritten essays (2006–2021) into machine-readable text.
 - Analyzed word count, paragraph structure, and sentence patterns to identify key trends.
 - Evaluated quote usage, historical references, and vocabulary complexity through statistical methods.
 - Used CKIPtagger for semantic analysis, comparing essay similarities and measuring uncommon word usage.
- **Impact**
 - Identified key factors of high-quality essays to improve teaching strategies.
 - Highlighted linguistic and structural disparities, promoting fairer evaluation criteria.
 - Laid groundwork for future research on academic writing standards in Taiwan.
- **Technologies Used**
 - Python (CKIPtagger, Jieba) for natural language processing and semantic analysis.
 - R (ggplot2) for data visualization and statistical analysis.
 - Regular Expression for pattern detection in textual data.
 - SimHash for semantic similarity assessment.

Examination Essay Sample Analysis

使用ckiptagger斷詞與分析詞性

佛祖見迦葉而拈花微笑，
兩人之間的會心無法為外人共享。

佛祖(Na) 見(VE) 迦葉(Nb) 而(Cbb) 拿花(VA) 微笑(VA) ' (COMMACATEGORY)

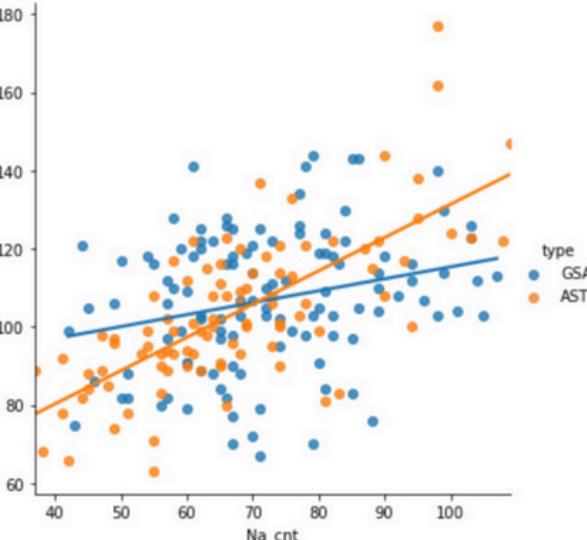
兩(Neu) 人(Na) 之間(Ng) 的(DE) 會心(Na) 無法(D) 為(P) 外人(Na) 共享(VJ) ° (PERIODCATEGORY)

中研院平衡語料庫詞類標記集

ADV	Dfb
ASP	Di
ADV	Dk
D	Dab, Dbaa, Dbab, Dbb, Dbc, Dc, Dd, Dg, Dh, Dj
N	Naa, Nab, Nac, Nad, Naca, Nacb
N	Nb
N	Nc
N	Ned
N	Nd
DET	Neu

*	動詞後程度副詞*
/	時態標記*
*	句副詞*
*	副詞*
*	普通名詞*
*	專有名詞*
*	地方詞*
*	位置詞*
*	時間詞*
*	數詞定詞*

104學測作文<獨享>佳作



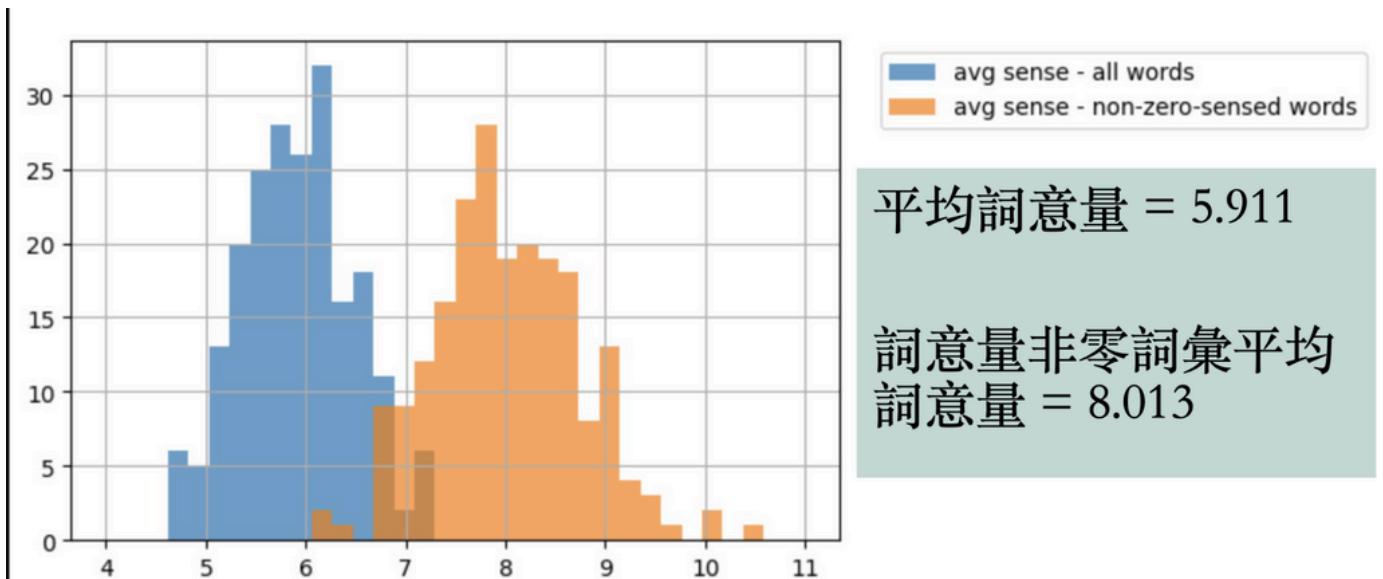
相似度分析

量化比較文本之間的相似度

$$d(\vec{p}, \vec{q}) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \dots + (p_n - q_n)^2}$$

$$\cos(\theta) = \frac{\vec{p} \cdot \vec{q}}{\|\vec{p}\| \|\vec{q}\|}$$

AST_100_1.txt	AST_100_5.txt	AST_100_11.txt	AST_100_14.txt	AST_100_2.txt
1.0000000	0.9649792	0.9228791	0.8584520	0.8566117
AST_100_9.txt	AST_100_8.txt	AST_100_3.txt	AST_100_6.txt	AST_100_13.txt
0.8483397	0.8353900	0.8117013	0.8043561	0.7923995
AST_100_12.txt	AST_100_7.txt	GSAT_99_5.txt	AST_100_4.txt	AST_100_10.txt
0.7863128	0.7645895	0.5575813	0.5367095	0.5320222
GSAT_104_10.txt	GSAT_101_4.txt	GSAT_103_3.txt	GSAT_104_6.txt	AST_101_6.txt
0.5244957	0.4695750	0.4048583	0.3981934	0.3897797

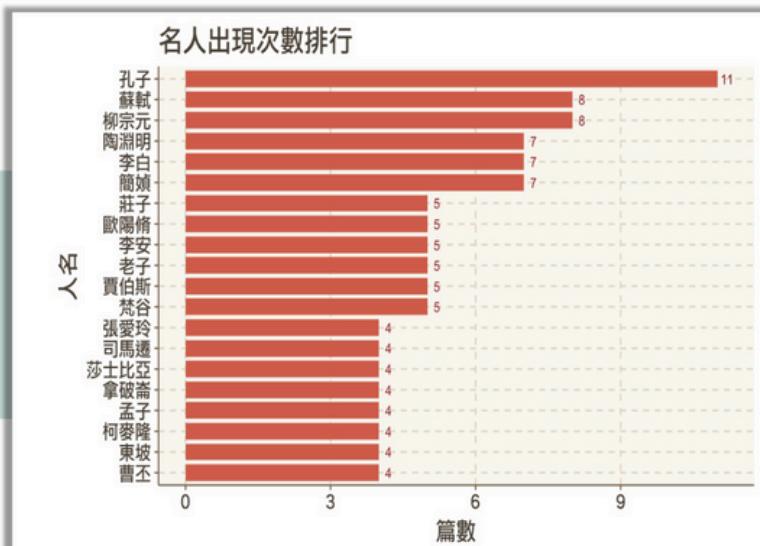


結果

名詞：Na(普通名詞)

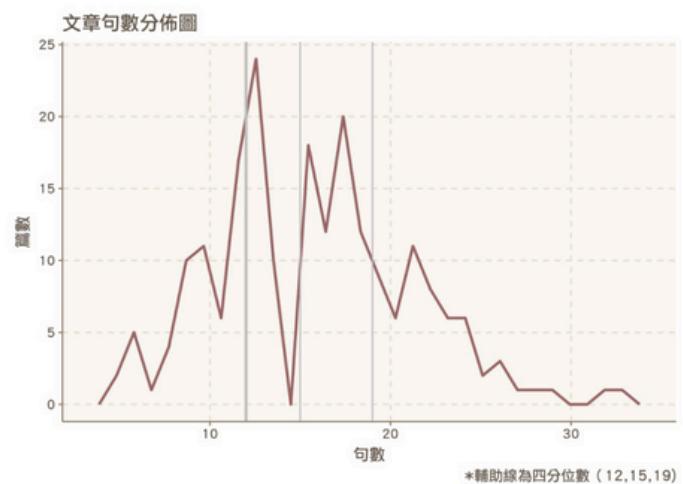
動詞：除 V_2(有) 外所有動詞

名人偉人 出現次數排行



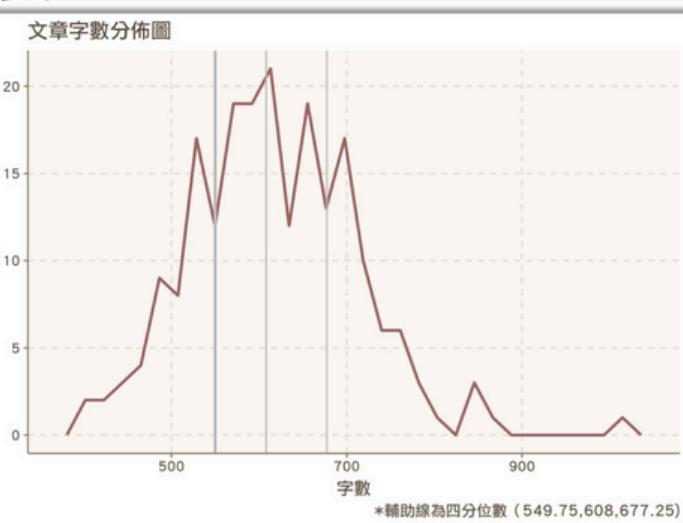
佳作文章句數

- 平均: 15.75
- 標準差: 5.17
- 中位數: 15
- 眾數: 13



佳作文章長度

- 平均: 615.21
- 標準差: 94.16
- 中位數: 607
- 眾數: 650



Competition & Honor

2020 Legal Tech Hackathon

Silver Award

AI-Assisted Judgment System for Jury Decision Support

- **Web** [Legal Tech Hackathon 2020 Facebook Page](#)
- **Final Round Replay** [Watch Here](#)
- Developed an AI-assisted judgment system to support jury decision-making in mental competency cases, addressing expertise gaps between citizen and professional judges.
- Leveraged machine learning to analyze judicial patterns and designed an intuitive interface tailored for both legal professionals and laypeople.
- Collaborated with interdisciplinary peers from computer science, psychology, and law, utilizing pseudo-labeling techniques to tackle overfitting challenges and improve model accuracy

2020 National Humanities Big Data Competition

Honorable Mention

Compensation Prediction System for Marital Rights Violation Cases

- **Web** [Event and Award-Winning Project Exhibition Website](#)
- **Objective** To create an ML-powered system predicting compensation in marital rights cases, improving accessibility for non-expert users.
- **Key Features**
 - Developed ML models, including decision trees and random forests, to predict compensation with high accuracy.
 - Designed an intuitive interface to simplify legal data, providing case-specific compensation estimates.
 - Conducted data preprocessing and regression analysis to identify key judicial decision factors.
- **Impact**
 - Provided accessible legal insights, enabling non-experts to make informed decisions.
 - Identified patterns and disparities in judicial rulings, promoting discussions on standardizing compensation policies.
 - Equipped policymakers and legal professionals with data-driven tools for evaluating case outcomes.
- **Technologies Used**
 - ML: Decision trees, random forests, and regression models
 - Data visualization and UI/UX design for an intuitive prediction interface
 - Data preprocessing and feature engineering for judicial case datasets



ILLINOIS ECE

THANK YOU

FOR REVIEWING MY PORTFOLIO

I LOOK FORWARD TO THE OPPORTUNITY TO CONTRIBUTE TO UIUC
AND FURTHER MY JOURNEY IN MASTER OF ENGINEERING

Contact Information

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