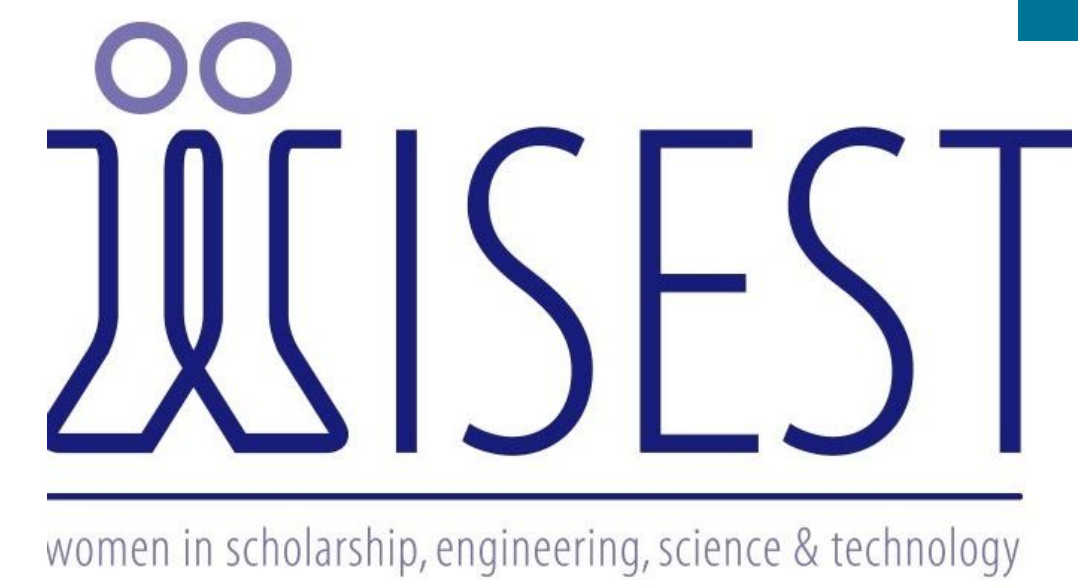


A Day in the Demographics of Mechanical Engineering:



Analyzing Data With MatLab

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MOTIVATION

My reason for doing this project was to understand the importance of analyzing raw data and how it helps companies set targets and pinpoint areas in need of improvement.

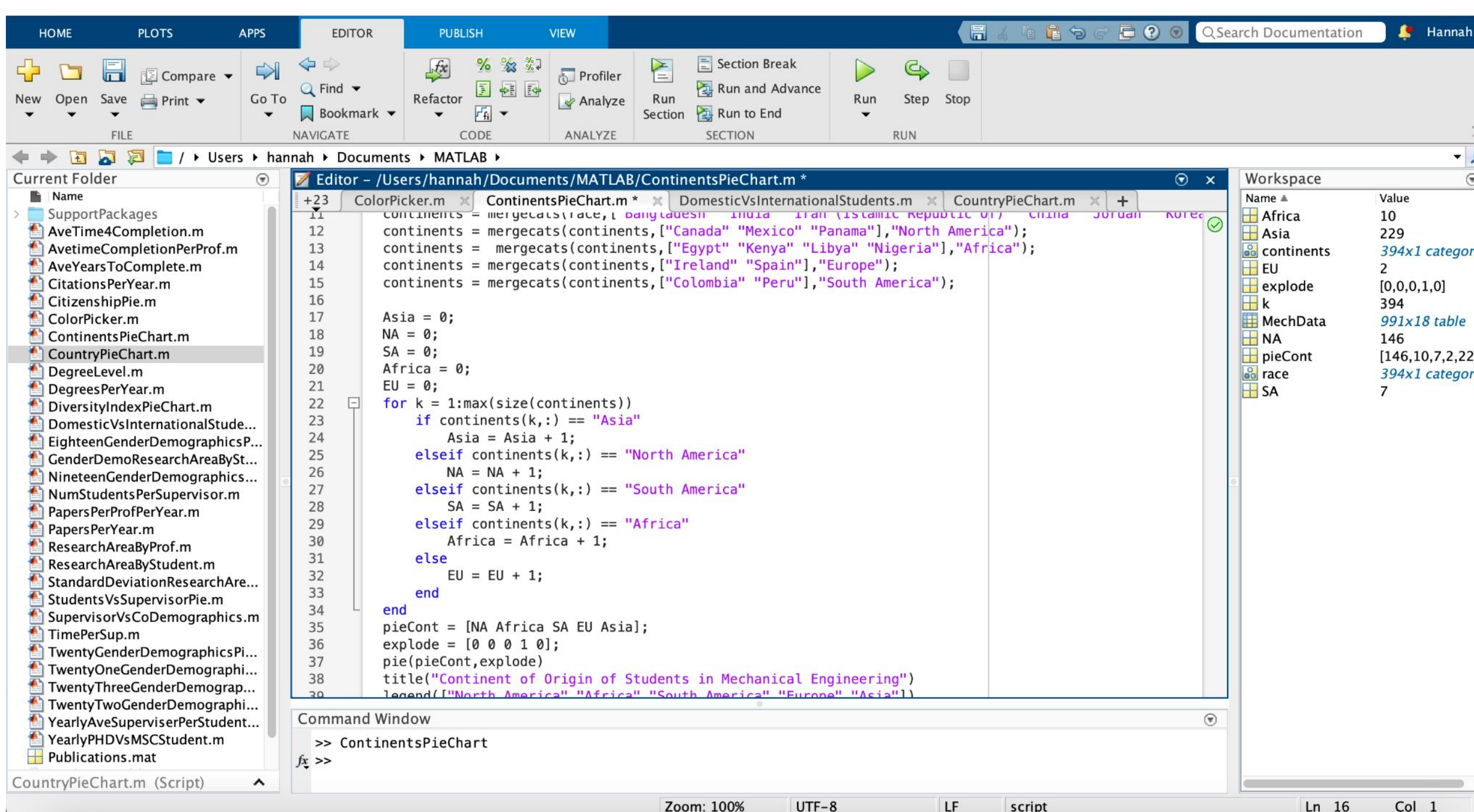
- Analyzing data is done through extracting and sorting data from a large quantity to identify trends and develop insights
- Developing a report on key departmental metrics can guide more strategic decision making, thus, increasing efficiency and productivity
- By analyzing this data, the Mechanical Engineering Department would be aware of areas to improve in student recruitment and student planning

However, overall, my purpose to do this project was to improve in programming through learning Matlab and the significance of software application in the workplace.

METHODS

Through MathWorks, I enrolled in online tutorials to learn the programming language MatLab.

- Matlab operates through typed commands and keywords (example: sum())
- Skills gained through this experience included:
 - Importing and sorting tabular data
 - Using arithmetic to solve problems
 - Developing a logical mindset
 - Using functions to improve efficiency
 - Plotting streamlined vectors and matrices



I was given a table of Mechanical Engineering Student's Data from 2018 to 2023 and Mechanical Engineering Publication Information from 2018 to 2023.

- This data was then plotted to visually identify the demographics of Mechanical Engineering Students and the number of papers published by the Department of Mechanical Engineering.

RESULTS

Gender Metrics in Mechanical Engineering in 2018

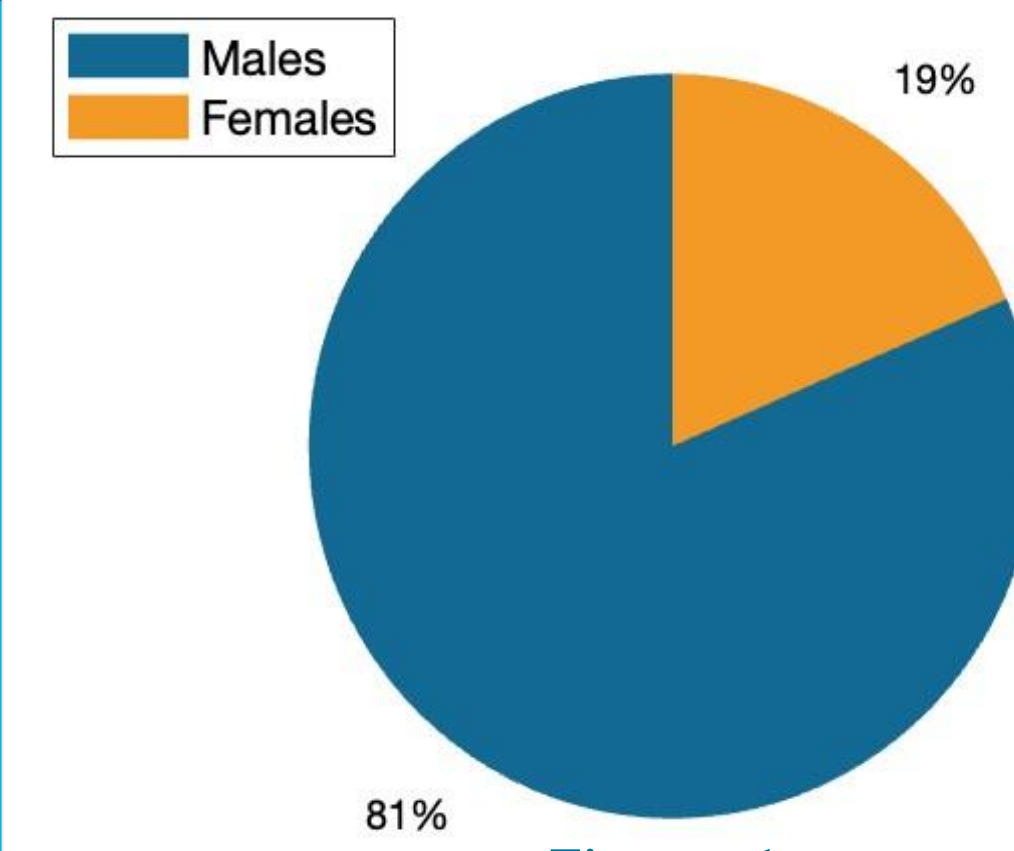


Figure 1

Gender Metrics in Mechanical Engineering in 2023

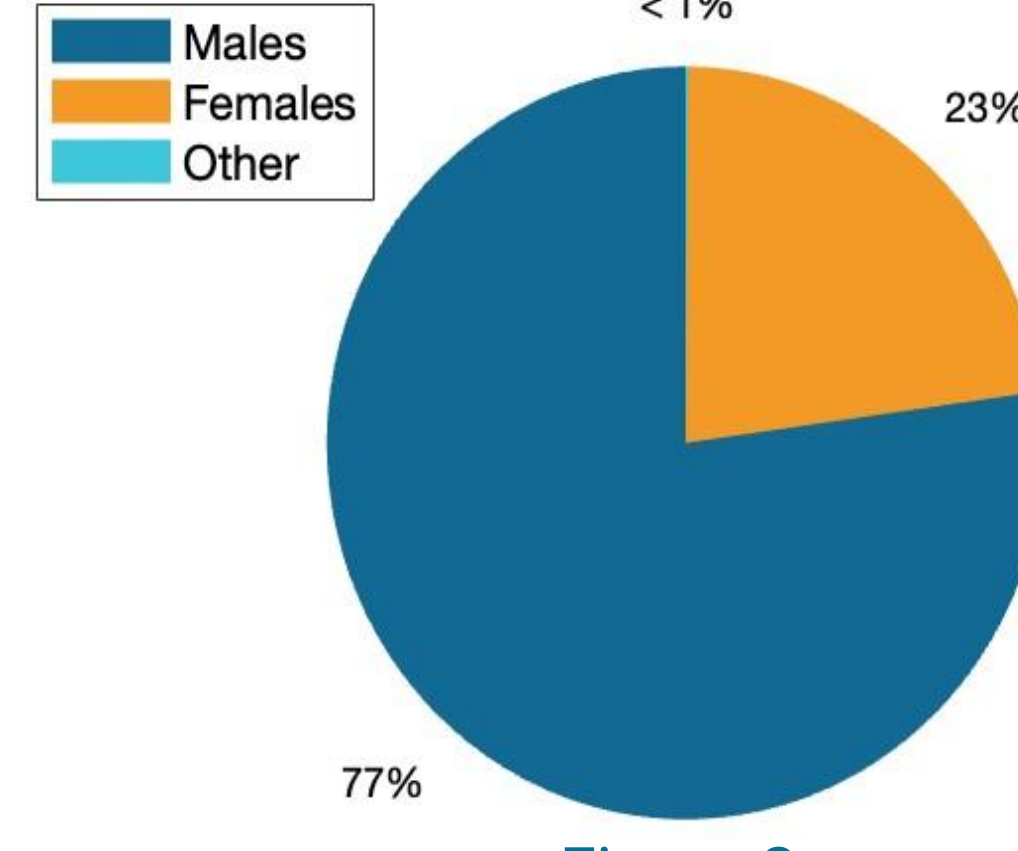


Figure 2

- Figures 1 and 2 show the improvement over 2018 to 2023 in diversifying the Mechanical Engineering Lab.

Diversity Metrics of Students in Mechanical Engineering 2023

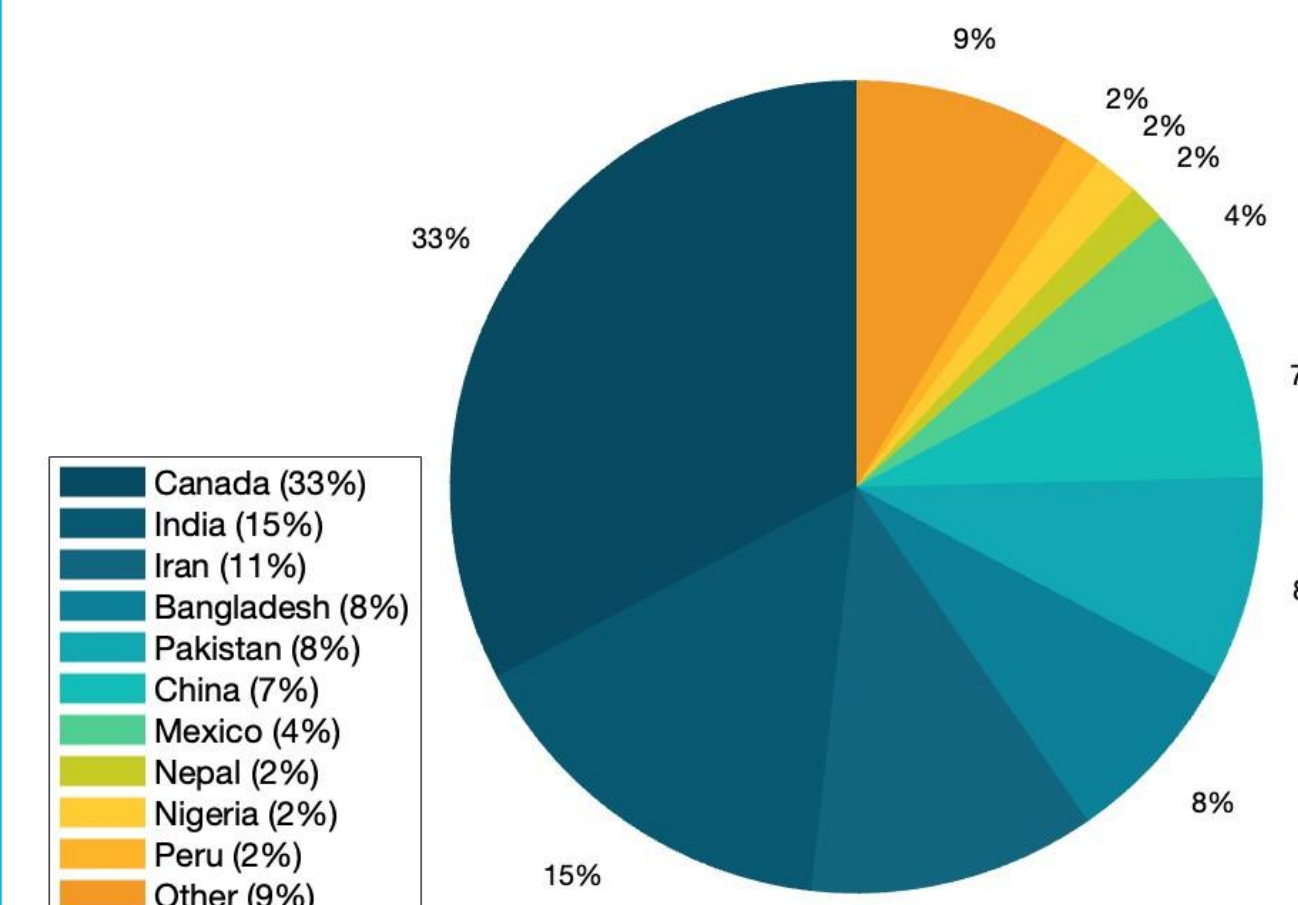


Figure 3

- Figure 3 displays the Country of Origin of the students actively in Mechanical Engineering. Note: Only 33% of the students are from Canada.

Average Number of Years to Complete a Degree 2018-2023

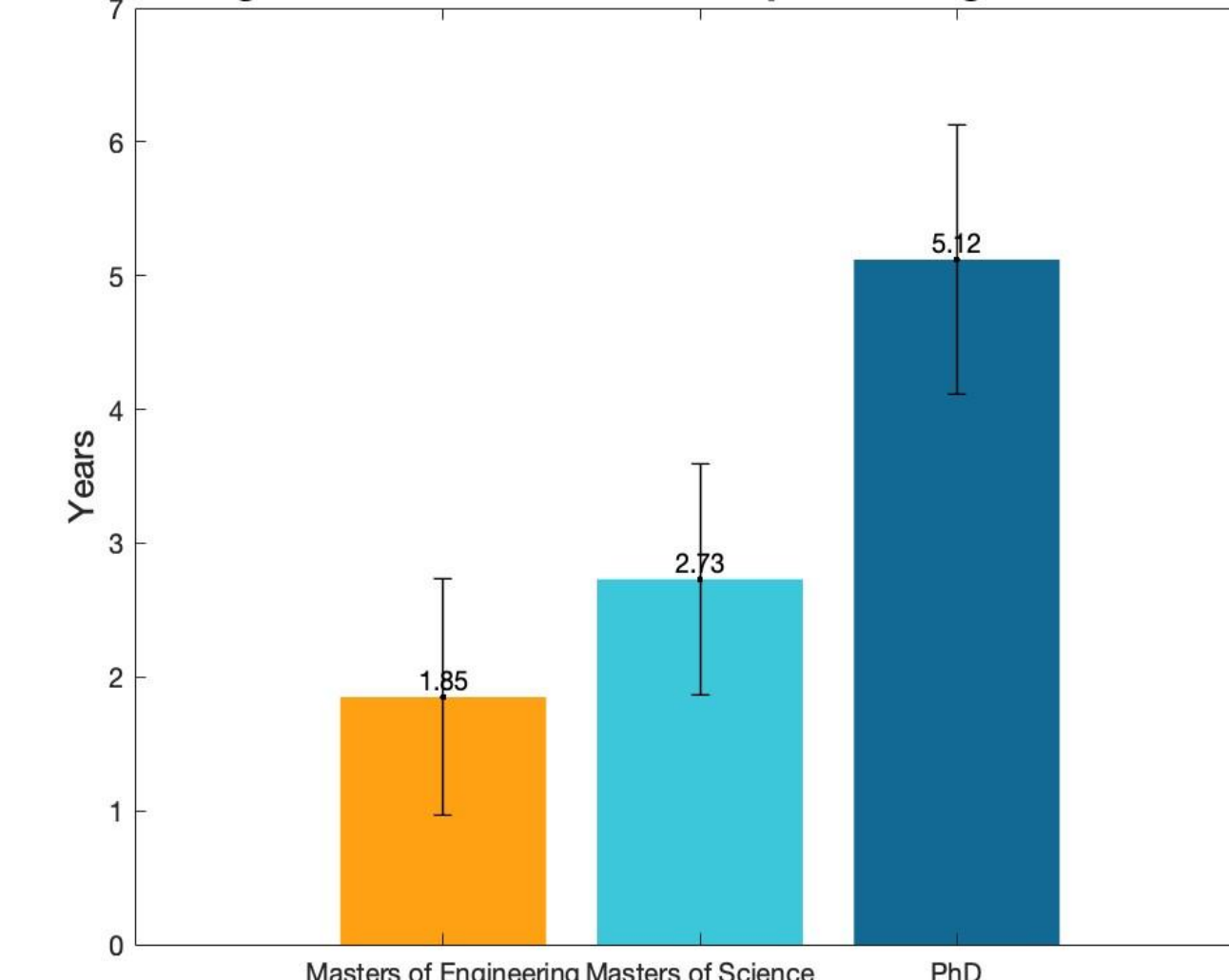


Figure 4

- Figure 4 shows the difference and standard deviation between the average time to complete a Masters of Engineering, Masters of Science, or PhD Degree in Mechanical Engineering.

Number of Students in Each Research Theme 2023

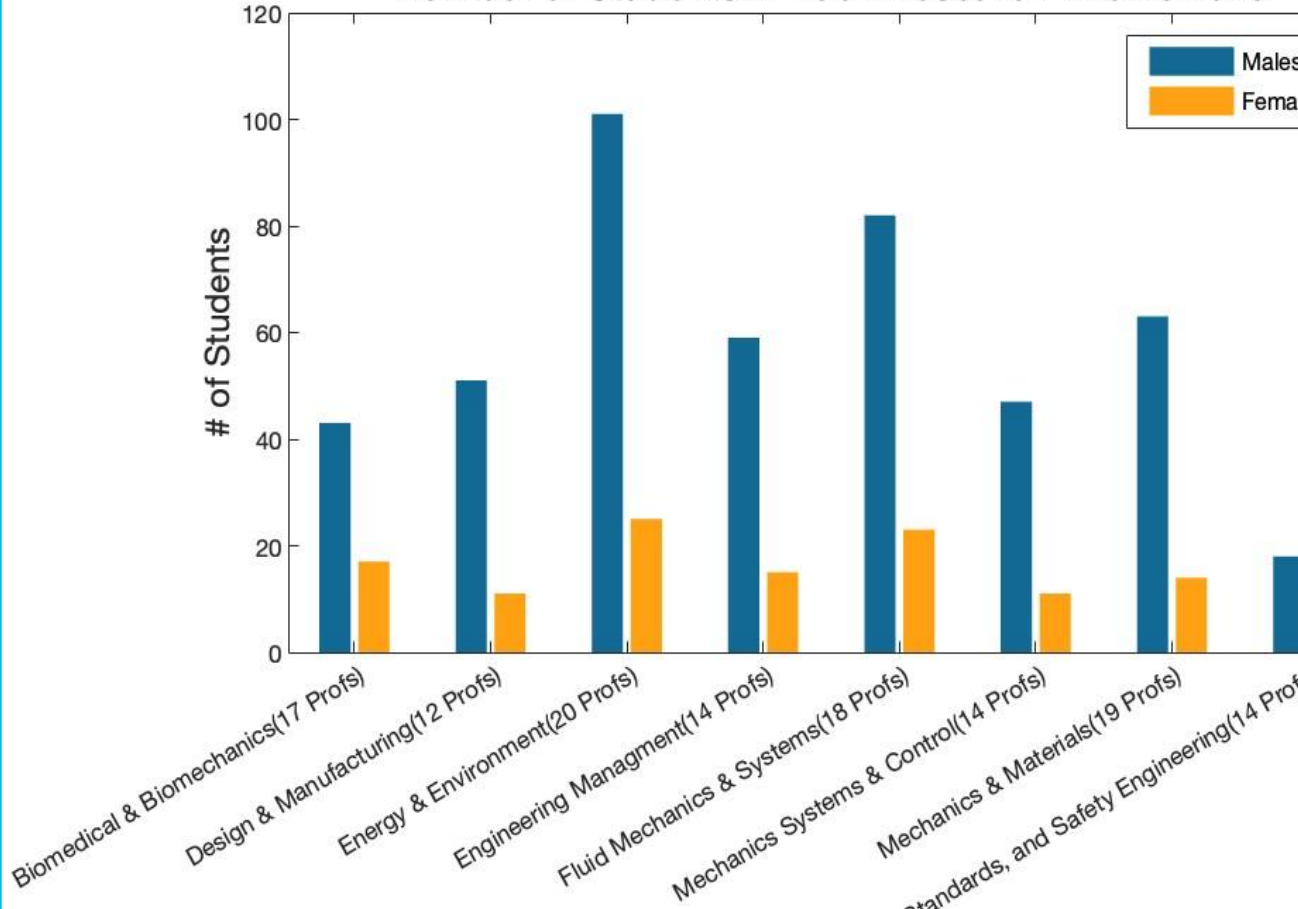


Figure 5

- Figure 6 shows the amount of journal articles published by Mechanical Engineering in 2018 to 2023.

Number of Papers Published Overall in Mechanical Engineering 2018-2023

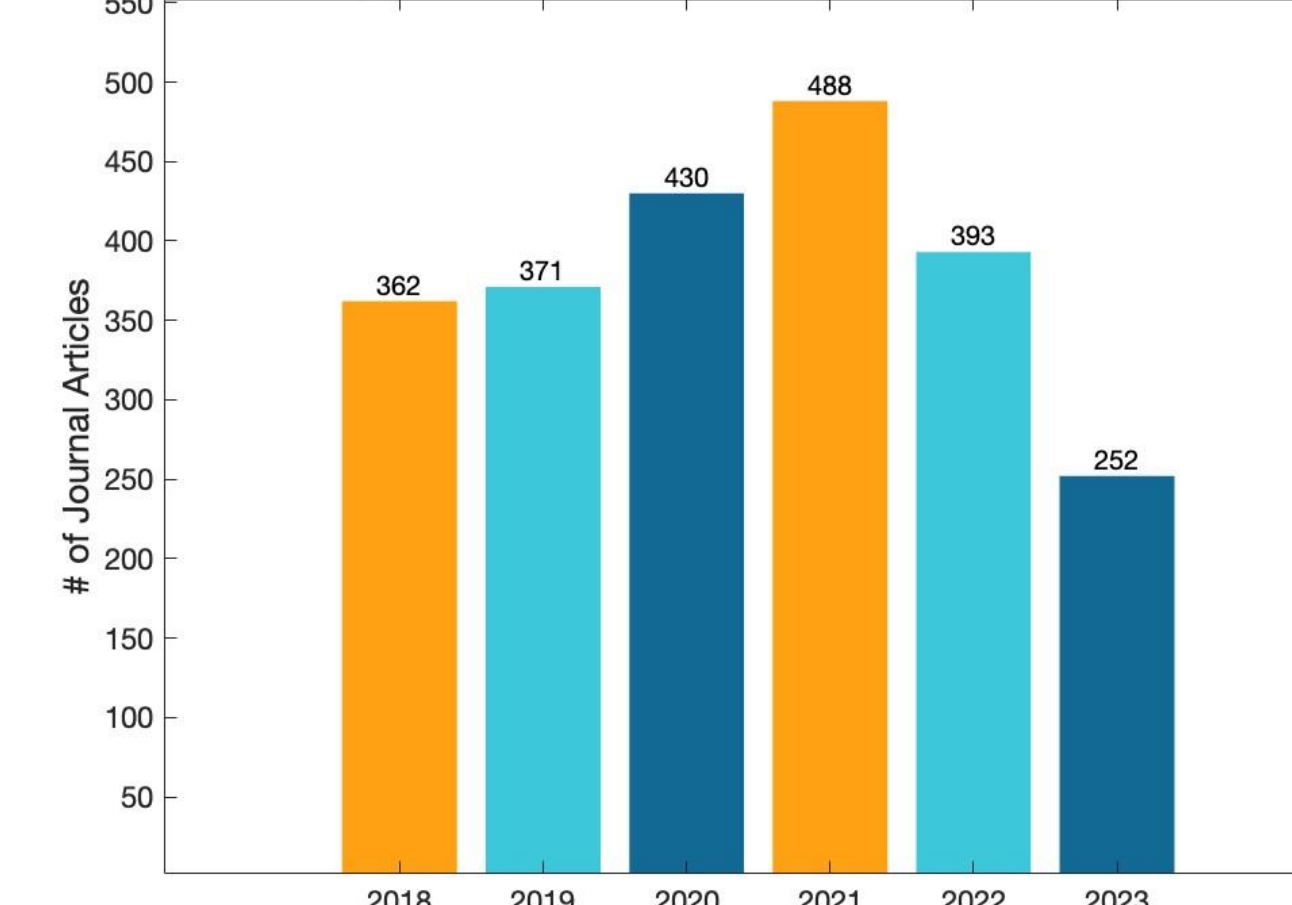


Figure 6

KEY TAKEAWAYS

- Despite the yearly improvement, there is little gender diversity in the Mechanical Engineering Department.
- Canadian Citizens make up a small minority of the students in Mechanical Engineering.
- PhDs take a long time to complete in comparison to Masters.
- The number of papers published by the Mechanical Engineering Department is dropping.

CONCLUSION

With this information, the University of Alberta and the Mechanical Engineering Department can make strategic decisions in the future to combat the issues surrounding student recruitment and student planning.

Areas for future improvement could include:

- encouraging more girls and gender diverse people to enroll in Mechanical Engineering through expanding programs like the WISEST Summer Research Program.
- inviting engineers to talk at high schools in Canada to increase domestic interest in engineering fields
- streamlining Mechanical Engineering PhDs by cutting down unnecessary parts of the course



- This experience of being in a Mechanical Engineering Lab and analyzing this data helped me grasp what Mechanical Engineering is truly about.
- It broadened my knowledge of programming, and taught me about statistical analysis.

ACKNOWLEDGMENTS

- Special thanks to James Hogan for organizing my research and giving me feedback and the students in my lab for their help.
- Thank you WISEST and the University of Alberta for providing this life-changing opportunity.
- Thank you to International Paper and Canada Summer Jobs (CSJ) for sponsoring my placement.

