

Do they choose what they are interested in : Analysis on students interests in majors

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Introduction

All of the undergraduate students in the College of Engineering University of Michigan enroll without declaring their major. During the orientation session, the school conducts a survey on their interested majors.

Understanding how students' preferences on majors change and how they relate to students' final declared majors allows the school to offer student-centered information and helpful advice on majors.

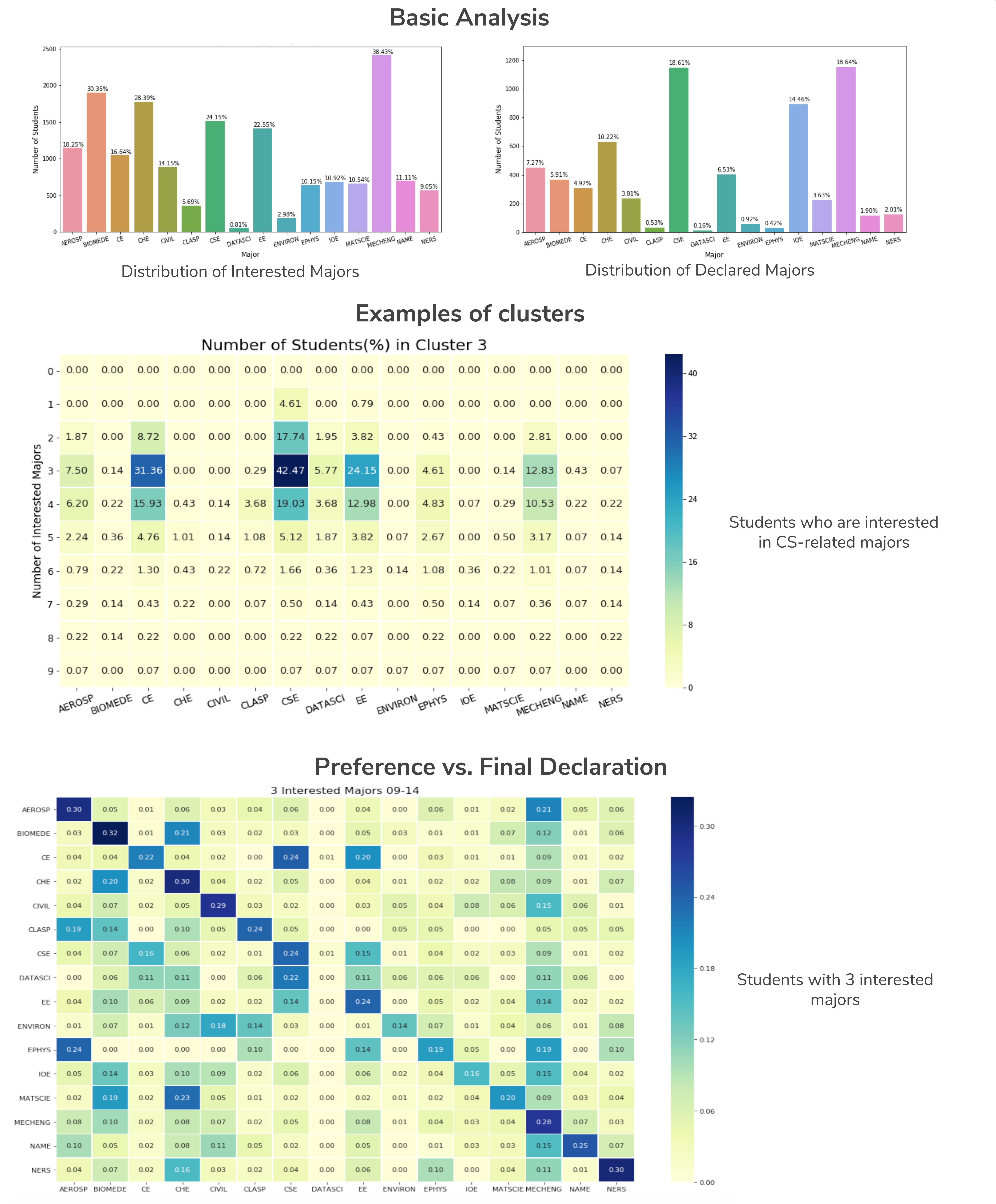
Data

We collected students' major preference and their final choice from 6000+ students.

Students can choose as many interested majors as they want but can only have no more than two majors as their final decision.

All the majors are engineering major and are listed below:

AEROSP - Aerospace Engineering
BIOMEDE - Biomedical Engineering
CE - Computer Engineering
CHE - Chemical Engineering
CIVIL - Civil Engineering
CLASp - Climate and Space
CSE - Computer Science
DATASCI - Data Science
EE - Electrical Engineering
ENVIRON - Environmental Engineering
EPHYS - Engineering Physics
IOE - Industrial and Operations Engineering
MATSCIE - Materials Science and Engineering
MECHENG - Mechanical Engineering
NAME - Naval Architecture and Marine Engineering
NERS - Nuclear Engineering and Radiological Sciences



Analysis & Discussion

I ran Agglomerative Clustering based on their interests in majors. By analyzing each clusters, I chose the cutline at 5 clusters and the characteristics of each clusters are listed below:

Group 1: Students interested in Physics-related majors such as Mechanical Eng. and Aero Space Eng.

Group 2: Students interested in major in big departments.

Group 3: Students interested in majors related to computer science.

Group 4: Students interested in Civil and Environment Eng.

Group 5: Students interested in life science such as Biomedical Eng.

Most students chose two to four interested majors. For each group of students with a certain number of interested majors, I drew heat maps of their preference and final decision on majors.

It's interesting to see that most students had a interest in Mechanical Engineering because this is a common perception about engineering. But many of them went to other majors. Also, students graduated with Industrial and Operations Engineering major had various interest when they first got to college.

References

- Scikit-learn: Machine Learning in Python, Pedregosa et al., JMLR 12, pp. 2825-2830, 2011.