SECURE for Student Success

Undergraduate Research Program

Manufacturing Systems Engineering and Management

California State University, Northridge

Research Duration:	Summer 2025 (June – August 2025)
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Title of Project:	Reaching consensus in group decision-making for collaborative agreement in business and academic environments

Goals and Objectives of the Project, Expectations and Outcomes

Learning to work in teams is essential for students, as most real-life decisions require collaboration and input from multiple people. Developing the ability to understand different opinions and learn from each other is crucial in these environments, where resolving conflicts and reaching consensus are key to success. Group decision-making brings together diverse perspectives, and decisions can greatly benefit from integrating these different points of view, though reaching consensus can be challenging when opinions differ. In this context, structured approaches for achieving collaborative agreement help teams make informed decisions by promoting open discussions, reducing conflicts, and ensuring that goals are aligned. This project develops a strategy to facilitate consensus-building in group decision-making, emphasizing collaboration and practical solutions in real-world business and academic contexts.

Students will begin their research activity by conducting a literature review on key concepts related to group decision-making, conflict resolution, and consensus-building in different environments. This will provide a strong theoretical foundation for understanding how diverse perspectives can be integrated to make better decisions.

This stage will conclude with the formalization of a set of criteria or decision-making drivers, observing how consensus can be effectively built and applied in the evaluation process. These drivers may address both business and academic scenarios: in business, they will cover key aspects like system reliability, efficiency, and quality; in academia, they will emphasize critical elements within engineering programs, such as inclusion, diversity, and promoting a respectful environment.

Next, students will engage in data-driven decision making by using a structured method programmed in Python. No prior experience with Python is required, as guidance will be provided throughout the project to ensure that all students can effectively use the programming tools to analyze different types of data and support decision-making processes.

Finally, students will apply their knowledge to practical cases, simulating real-world scenarios where group decision-making and data analysis are essential. By working through these cases, students will experience firsthand how to use data and collaboration to solve business problems and make informed decisions in teams.

The objective of this project is to equip students with the skills and knowledge needed to effectively engage in group decision-making in several contexts. By the end of the project, students will also have the opportunity to compile their findings into a formal research paper, with the (tentative) goal of submitting it to an academic conference. Outcomes of this project will be the production of a research poster to be displayed at the annual research symposium in early Fall 2025, along with an oral presentation delivered by the students at the same event.