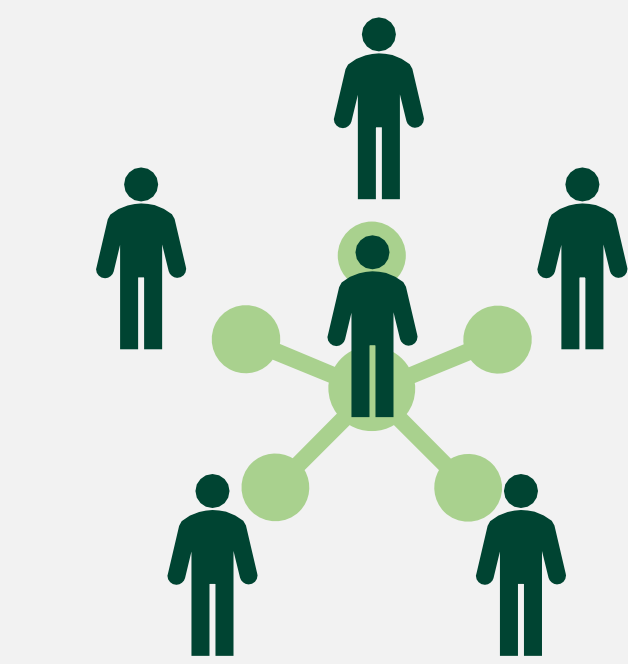


# Understanding Impacts of Social Network Interventions on Engineering Project Outcomes

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## ABSTRACT



### What is a social network?

A social network is the network that shows social interactions and relationships between people.

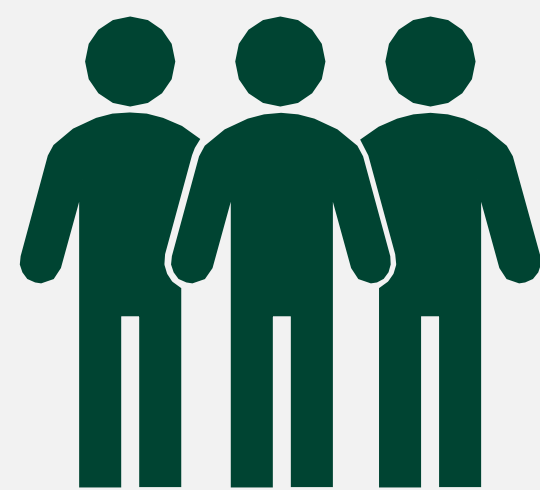
### Social networks in engineering teams

Engineering project performance depends on both the performance of individuals and the social networks through which knowledge flows between team members. These networks impact information access and the ability of team members to coordinate as they work towards common goals.



### What is the central hypothesis of this study?

The central hypothesis of this study is that social network interventions provided within critical episodes of inter-organizational Architecture, Engineering, Construction (AEC) projects and repeated throughout project delivery will improve team integration (e.g., interactions among interdisciplinary experts) and therefore, optimize sustainability outcomes.



### What is the goal of this study?

The overall goal of this study is to advance our understanding about how interactions among inter-disciplinary experts help improve sustainable AEC projects from an engineering design perspective.



## BACKGROUND

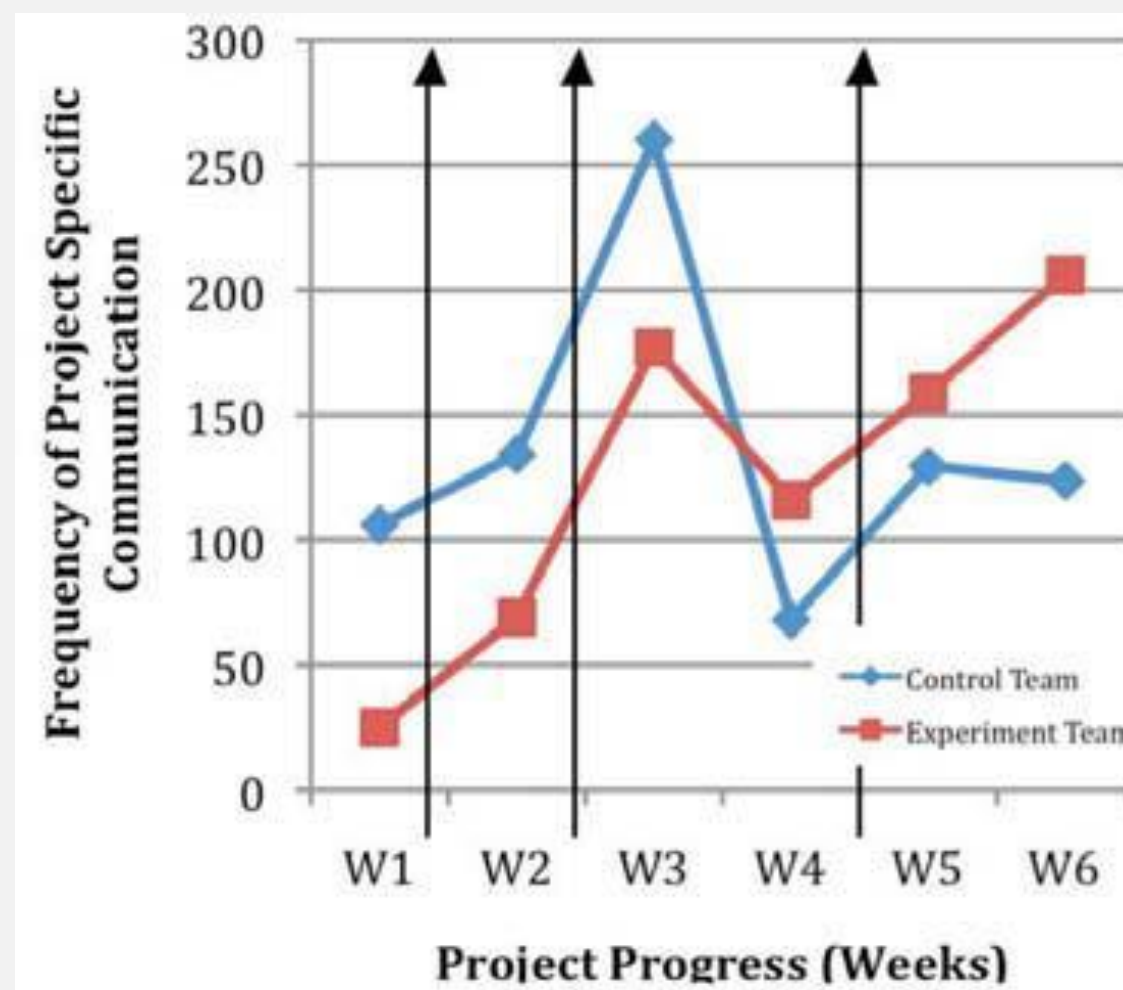
### Preliminary Studies

Two preliminary studies provided strong evidence for the value of this proposed research and built the groundwork and specific expertise for our team in this unique domain.



### 1. Experimental and Empirical Research

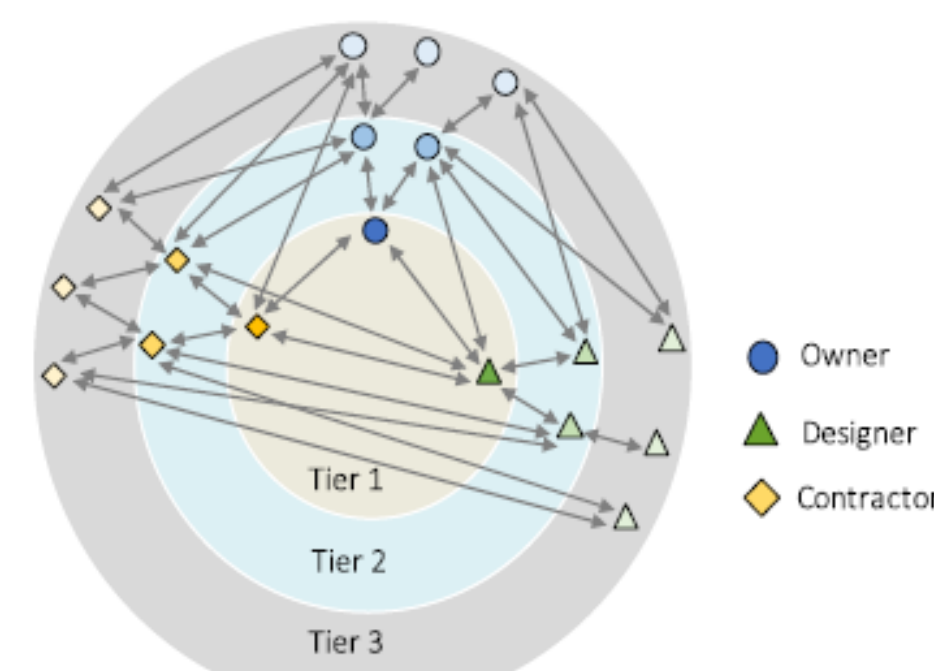
In a graduate course, two student teams were created, and the steps of proposed study were applied to these groups. The experiment team received multiple interventions and the control team was only observed. The experiment team produced better project outcomes.



*Project specific communication change over time for control and experiment teams. (Arrows represent interventions).*

### 2. In-depth Case Study

In an AEC project case study, the researchers mapped the inter-organizational relationships of this project and mapped them over time observing the change in team dynamics and measuring their effects on performance outcomes.



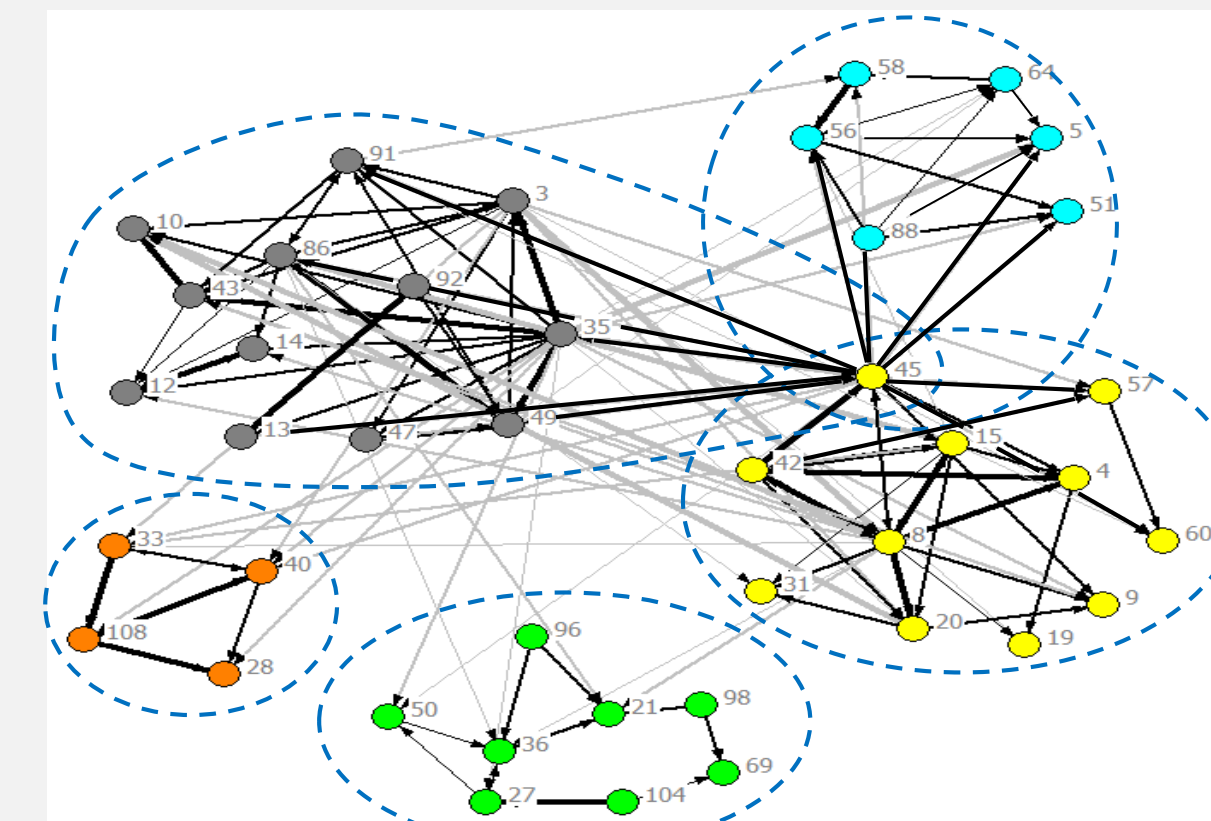
*Sociogram showing information exchange patterns among disciplines and in an AEC project team.*

## METHODOLOGY

**Task 1: Data Collection:** Two different projects, one is control and one is treatment, will be observed. The online data exchange information will be collected.

**Task 2: Identification of Sub-Groups and Their Leaders:** According to the data exchange frequency and variables, the sub-groups and their leaders will be identified .

**Task 3: Individual Level Intervention: Connecting Sub-Group Leaders:** The researchers will meet sub-group leaders of the treatment group and ask them to validate the sociograms.



*A sociogram showing the sub groups and the connections between individuals in a network of an AEC project team.*

**Task 4: Sub-group Level Intervention:** New sub-groups will be generated or removed to improve sustainability outcomes in the treatment project.

**Task 5: Analysis of Network Intervention Impact:** The goal of this task is to evaluate the impact of network interventions on project sustainability outcomes by comparing the treatment and control project outcomes.

**EXPECTED OUTCOMES:** The research outcomes will provide an engineering solution systematically improving team integration in inter-organizational AEC to enhance project outcomes, especially those related to sustainability.