The Formics Project translates the natural structure-building phenomena of ant-bridges into architectural componentry that intuitively self-aggregates into goal oriented structures. This digitally enabled and physically flexible componentry we call Behavioral Componentry.

QUESTION

Can we build like these ants do? Can complex, emergent organizations such as an ant bridge be documented and precisely built using the same agent-based rules that govern their design?

POSITION

A major limitation of building complex architectural form is interfacing with the manual assembly process of the construction industry. This is foremost an issue of communicating precise variations in component location and orientation to a construction worker who is repetitively assembling large populations of generic elements. We have found that utilizing behavioral construction documents, which describe assembly rules rather
than traditional location and orientation information, exponentially decreases construction time, document length, construction error, and required worker skill level.

**PROCESS**

Through an independent seminar faculty, students and outside experts collaborated to explore the limits of standard two-dimensional documentation, invent novel indexing systems of description, and delineate a prefabrication and pre-assembly process that brings efficiency and order into the construction of complexly aggregated architectural systems. Our work progressed through iterative scripted and physical prototypes, ultimately culminating in a 680-component structure built solely off of a “Behavioral Construction Document.”

**MICHAEL JAMES ROGERS** is an architect, artist and computational researcher based in the USA. His practice explores biological models of organization and growth through the creation of emergent component-based design systems at many scales. Michael James Rogers currently serves as a research professor at the University at Buffalo and collaborates with designers around the world on several active art and architectural projects.

The work of Michael James Rogers has been shown at NASA’s Jet Propulsion Laboratory, the Venice Biennale, London Festival of Architecture, Beijing Design Week, Albright-Knox Art Museum and the Burchfield Penney Art Center among other venues.