

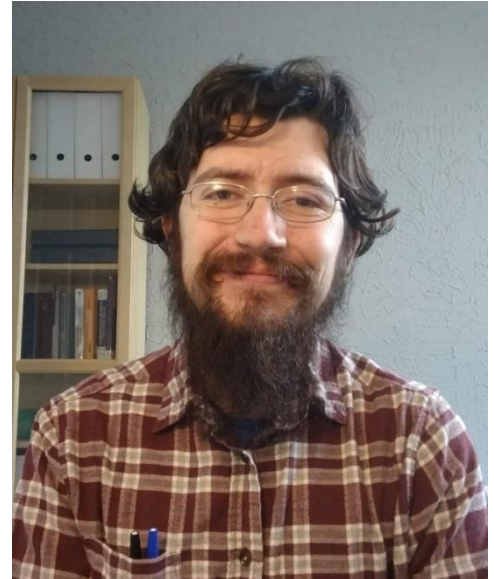
# Michael Desch

## I'm a Structural Engineering Researcher

I am a structural engineering researcher working towards my PhD at Illinois Institute of Technology. My areas of expertise include structural analysis, finite element analysis, solid mechanics, material science, and structural reliability.

Structural Engineers conceptualize, analyze, and design all sorts of structures like buildings, bridges, and dams. It is the structural engineers' job to predict all the forces that will act on a structure (such as the weight of snow, pressures from the wind, or the weight of the structure itself). The engineers then design a structure that can hold up even under the worst combination of all these forces. It is the engineers' job to keep everyone in, on, or around a structure safe. So, they are very careful to make sure every structure is strong, stable, and serviceable.

Engineering Researchers develop the methodologies, equations, and tools that practicing engineers use. They test new theories and look for ways to improve existing analysis and design methods.



## Current Project

Under certain types of repeated loading, many materials can become damaged and wear out over time. This is a phenomenon known as fatigue. Engineers consider fatigue when they design a structure and use mathematical models to predict when the structure should be replaced do to fatigue damage.

I am using structural reliability techniques to improve these mathematical models so that the engineers using them do not need to make as many assumptions. This can help keep a structure safer and can give engineers a better idea of when it will need to be replaced.

## What do you think?

What are some ways we can improve the reliability of our bridge and building designs?

How can we use new mathematical methods to improve our structural models?