ABSTRACT:
The tricuspid valve regulates blood flow from the heart to the lungs. Clinicians have historically ignored the pathologies afflicting the tricuspid valve and assumed they would naturally regress after repairing the mitral and aortic valves. However, a seminal clinical study in 2005 demonstrated that the tricuspid valve pathologies warrant more direct attention to improve long-term patient outcomes. In this talk, I will summarize the experimental methods and computational approaches that I have developed to improve our biomechanical understanding of the tricuspid valve. These include exhaustive biaxial mechanical characterizations, experiment-informed constitutive modeling, and finite element predictions of the valvular function in healthy and diseased scenarios. I will then conclude with my recent breakthroughs and discuss how the tools I have developed can be used in emerging cardiovascular topics.