

Scalable Solution of Chance-Constrained Nonlinear Programs

Victor M Zavala, University of Wisconsin-Madison

We discuss strategies to solve large-scale chance-constrained nonlinear programs (CC-NLPs). Specifically, we discuss moment-matching approaches that exploit physical and/or structural properties of the problem to reformulate the CC-NLP into a standard NLP. We also present a smooth reformulation for general CC-NLPs that uses sigmoidal functions to create conservative approximations. We show that this approach provides significant improvements over the well-known CVaR-constrained approximation. We also outline existing challenges and discuss potential approaches to tackle them.