

**When:** Friday 12:40 – 13:30, February 14, 2020

**Where:** ETB 1020

**Speaker:** **Meltem Apaydin**

Ph.D. Student in Prof. Xiaoning Qian's Group  
Department of Electrical and Computer Engineering  
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**Title:** **Pessimistic Bi-Level Optimization for Microbial Engineering Applications**

**Abstract:** Different objectives in metabolic engineering applications have to be optimized under the mathematical models of the corresponding systems with uncertainty. In such applications, the problems can be modeled as a bi-level optimization problem with an engineering objective at the outer level and a cellular model at the inner level. In this talk, I will present how we can incorporate modeling uncertainty due to the non-cooperative behaviors of cellular and engineering models. I will first focus on the validity and robustness of existing bi-level methods for strain optimization under uncertainty and non-cooperative environment. Then, I will present novel pessimistic optimization formulations to deal with such problems with supporting results for obtaining robust knock-out strategies and better understanding of microbial interactions.

**Bio:** Meltem Apaydin is a Ph.D. candidate student in Electrical and Computer Engineering at Texas A&M University. She received B.S. in Electrical and Electronics Engineering from Anadolu University, Turkey and M.S. in Electrical and Computer Engineering from Texas A&M University. Her main research interests are machine learning, optimization, and their applications in life science problems.