DEPARTMENT of INDUSTRIAL ENGINEERING
UNIVERSITY of HOUSTON

FRIDAY SEMINAR SERIES
BROADEN HORIZONS | EXTEND MINDS

Mr. Tanapol Kosolwattana
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Dept. of Industrial Engineering.
University of Houston

**Date**: Friday, Oct. 13, 2023
**Time**: 1 - 1:50 pm
**Location**: Melcher 180

# *Online Modeling and Monitoring for Dependent Dynamic Processes under Resource Constraints*

**Abstract**: Adaptive monitoring of a large population of dynamic processes is critical for the timely detection of abnormal events under limited resources in many healthcare and engineering systems. Examples include the risk-based disease screening and condition-based process monitoring. However, existing adaptive monitoring models either ignore the dependency among processes or overlook the uncertainty in process modeling. To design an optimal monitoring strategy that accurately monitors the processes with poor health conditions and actively collects information for uncertainty reduction, a novel online collaborative learning method is proposed in this study. The proposed method designs a collaborative learning-based upper confidence bound (CL-UCB) algorithm to optimally balance the exploitation and exploration of dependent processes under limited resources. Efficiency of the proposed method is demonstrated through theoretical analysis, simulation studies and an empirical study of adaptive cognitive monitoring in Alzheimer's disease.

**Biography**: Tanapol Kosolwattana is a fourth-year Ph.D. student in Industrial Engineering at the University of Houston, advised by Prof. Ying Lin. He received a B.S. degree in Computer Science from the University of Virginia, Charlottesville, VA, in 2020. His research interest includes statistical learning, reinforcement learning, multi-armed bandits, and sequential-decision making focusing on personalized medicine, disease prevention and monitoring.