Cyber-physical systems under DoS attacks, a control systems perspective

Dr Marcio Lacerda

London Met

Monday 28 May 2024
1300hrs
LR7, IEB

Abstract:

With the advance of computation and communication systems, the control design for dynamic systems has become even more challenging. In this context, the class of cyber-physical systems (CPS) has emerged. In a CPS, devices communicate with each other and the physical world through sensors and actuators, integrating computation with physical processes. The existence of malicious agents that intend to degrade the system's performance through cyber-attacks is a reality in this scenario. In this talk, I will address the control design problem for CPS under the threat of denial-of-service (DoS) attacks. The system under attack is modelled as a switching system constructed following the limitation of the malicious agent of launching continuous DoS attacks. Different actions are proposed to mitigate the effects of the attack on the system. Linear Matrix Inequalities will be employed to present the design conditions for CPS in the presence of cyber-attacks. I will also discuss some perspectives for future research on this topic.