סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 20.08.15 (ה' באלול, תשע"ה), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

יוצר: לירן מלאכי

מנחה: פרופ' לאוניד מירקין
מנחה שותף: ד"ר מקסים קריסטלני

על הנושא:

בקרה אופטימלית של מערכות טלאופרציה דו-צידיות שיתופיות
Optimal control of cooperative bilateral teleoperation systems

להלן תקציר ההרצאה:

Teleoperation systems are used to expand operator's abilities to remote environments. In such systems the operator uses an interface device, a “master”, to manipulate a remote robotic system, a “slave”. Bilateral teleoperation notion refers to the case in which haptic feedback is provided to the operator in order to create a telepresence experience for the operator, i.e., the ability to “feel” the remote site. In this talk, we concentrate on a control problem arising in cooperative bilateral teleoperation, i.e., in the case when two operators are manipulating two slave devices in a shared task environment. A situation like this may occur, for example, in a surgery with dual master consoles.

Some of the main challenges associated with such systems arise from communication delays, which in many practical cases may not be neglected. Most of works in the field of delayed teleoperation are based on passivity methods. This approach guarantees stability regardless the communication delay length. However, it is based on ad-hoc control structures that are restrictive in terms of performance. Moreover, the passivity requirement might not be met in many situations.

The development of alternative optimization methods is impeded by the decentralized nature of the problem. In this work, we try to bridge this gap by formulating the H2 optimization problem and showing how it can be split into smaller centralized problems. We show that these problems can be made tractable by carefully defining the optimization criterion. This enables us to develop a convenient framework for controller synthesis, which will be demonstrated in this talk.

בברכה,

שרון אמיר

מרכז הסמינרים