

סמינר - SEMINAR

הנד מוזמנת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 5.11.12 (כ' בחשוון, תשע"ג), בשעה 14:30, בחדר 641 בבניין ליידי-דייויס.

ירצה:

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על הנושא:

Rock and Roll - How Do Flies Recover From Serial Stumbles?

להלן תקציר ההרצאה:

Flying insects manage to maintain aerodynamic stability despite the facts that flapping flight is inherently unstable and that they are constantly subject to mechanical perturbations, such as gusts of wind. To maintain stability against such perturbations, insects rely on fast and robust flight control mechanisms, which are poorly understood. Here, we directly study flight control in the fruit fly *D. melanogaster* by applying mechanical perturbations in mid-air and measuring the insects' correction maneuvers. On each fly we glue a small magnet, 1.5mm long, and use pulses of magnetic field to apply torque perturbations along the fly's roll axis. We then use high-speed filming and 3D hull-reconstruction to characterize the detailed kinematics of their correction maneuver and show how the flies fully recover from roll perturbations of up to 70° within 7-8 wing beats (30-40ms), which is faster than their visual response time. In addition, we study the dynamics of the maneuver by calculating the aerodynamic forces and torques the flies produces. Finally, we find which wing degrees-of-freedom the flies actuate during the correction and present a control mechanism that can explain the maneuver. These results have implications ranging from the neurobiological and structural mechanisms that underlie flight control to the design of flapping robots.



בברכה,

פרופ' נח צ'ור ארניאל
מרכז הסמינרים

המארח: ד"ר מורן ברקוביץ'