סמינריון

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על הנושא:

ראיה אקטיבית:
מביוקינמטיקה והתנהגות בעלי חיים לרובוטיקה
Active Vision:
From Biokinematics and Animal Behavior to Robotics

להלן תקציר ההרצאה:

Most animals rely on active processes in vision: in the same manner Humans move their eyes to obtain more information about a scene, numerous animal species perform restricted eye or head movements to improve their visual perception. Barn owls (tyto alba) perform peculiar head movements but hardly move their eyes when scanning their environment, a phenomenon which facilitates the study of active vision mechanisms in barn owls.

The objective of this multidisciplinary research is to enhance the scanning performance of robots equipped with a visual system with an active viewpoint manipulation inspired by barn owls scanning motions.

In a first step, we performed a thorough kinematic analysis of barn owls head movements with emphasis on the rotational and linear features by means of tools from Screw Theory, and with focus on peering motions, typical side-to-side head motions used by owls and other animals for visual scan. Subsequently, we developed a robotic platform for reproducing the bird's scanning motions. The robot, with five degrees of freedom and equipped with the Kinect depth camera, was designed for a viewpoint manipulation study comparing peering trajectories performed by barn owls with different types of movements. By means of KinectFusion algorithm providing 3D model from depth video sequence, the motions were compared in regards with the reconstruction quality obtained on static model scans. The statistical significance in the results of this study shows that scan accuracy was improved in bio-inspired motions.

בברכה,

פרופי/א אמיר פם

מרכז הסמינרים