Einladung zum Vortrag im Kolloquium Technische Kybernetik

Differential Flatness Based Design, Planning, and Control of Under-actuated Robots

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Vortragskurzfassung

Under-actuation is common in robotics. Planning and control of nonlinear under-actuated robotics systems is an area of ongoing research. A fully actuated robot can execute any joint trajectory within its configuration space. However, under-actuated robots may be severely restricted in their ability to perform motions. This talk will exploit the underlying structure of governing dynamics of classes of robots, and through alteration of inertia distribution within the system, establish properties such as "feedback linearizability" and "differential flatness" to achieve integrated planning and control. This approach is applied to three classes of under-actuated systems: (i) planar open-chain manipulators, and (ii) bipedal walking robots, (iii) closed-chain robots.

Lebenslauf

Sunil K. Agrawal received a Ph.D. degree in Mechanical Engineering from Stanford University in 1990. He is currently a Professor of Mechanical Engineering at University of Delaware and is the Director of Mechanical Systems Laboratory. He has published close to 250 journal and conference papers and 2 books in the areas of controlled mechanical systems, dynamic optimization, and robotics. Dr. Agrawal's honors include a Presidential Faculty Fellowship from the White House, a Bessel Prize from Alexander von Humboldt Foundation, a Fellow of the ASME, and a Humboldt U.S. Senior Scientist Award. He holds the title of a distinguished Visiting professor of mechanical engineering at Hanyang University in Ansan.