

MECHANICAL ENGINEERING STUDENT SEMINAR

Wednesday, April 13 2022 at 13:00, Betty and Dan Khan Building, Auditorium 1.

Online: <https://technion.zoom.us/j/2453752206>

3D Minimum-Time Soft-Landing

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Soft Landing is best known in operations such as moon landing. In such operations one is interested in minimum fuel consumption. In the present paper we are interested in rescue operations using unmanned aerial vehicles (UAV), where minimum time is of interest. The well-known double-integrator minimum-time to the origin, applying bounded control, is a starting point as 1D version of our objective. Instead of directly solving the 3D soft-landing norm-bounded optimal control, we first discuss an interception version, and show that a careful treatment using a bifurcation property enables one to decide on the soft-landing case. Surprisingly, both interception and soft-landing have the same control structure. The key difference is a time-to-go quartic polynomial equation, where one is interested, for interception in the smallest, and for soft-landing in the largest positive real root. Furthermore, the strategy presented here can force soft landing in the presence of a bounded disturbance

The seminar will be given in Hebrew

