ECE209AS (Fall 2025)

Computational Robotics

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Lecture 1 | Systems and state

Addendum to lecture videos

Clarification

In the discussion about the state estimation problem (starting around 16:20 in part c), I mentioned that we don't often consider the state estimation problem when applied to the computational system itself. To be clear, it's not that we can't, it's just typically more often used in the context of estimating a hardware system.

That being said, any system is eligible for state estimation: note that the state encodes the time history of the inputs as well as all unknowns (noise/error/uncertainty etc.). Thus, even for the case of a computational system where we've invented our own notion of state and have access to all the data values in memory, the true value of the state will depend upon some unknown/unmeasurable quantities by definition, and so it too must be estimated if we need to know it. We will discuss this in more detail later in the course when we talk about the state estimation problem more thoroughly.