# Learning control To-Do list:

* Why is it necessary to use commutation functions? What requirements do they need to satisfy (continuous/periodic/parallel to each other, etc)?
* Once commutation functions are chosen, can you sketch a plot of the input-output behavior, i.e., y as a function of α?
* What can you say about stability?
* What does this example (Simulation example on Canvas) teach you about the invertibility and monotonicity of the (y, α) relationship?
* How can it happen in practice that a simple commutation function leads to a non-invertible (y, α) relationship?
* (Finding commutation functions that lead to a monotone/invertible (y, α) relationship might prove to be an important aspect of the challenge)
* If piezo-stepper systems are effectively static functions, as opposed to dynamic systems, what consequences does that have for learning control?
* What is the impulse response matrix?
* Whatabout the state(s)?
* What does it mean for the state(s) to reset, and what does this mean differences/equivalences between repetitive control and iterative learning control?
* Could you also implement an LTI feedback controller?
* If you decide that you want to change the commutation functions, how will you parameterize them?
* Think about this effect (voltage hysteresis); can you mitigate the effect using smart initiation?
* What period do you choose to consider for learning?
* Consider your ILC trial length / RC period (whole motion vs one step)
  + Pros and cons