

1. The choice of an initial guess is crucial to the quality of a solution in convex optimization.

- (a) true
- (b) false

Solution: False, no matter where you start from (in the absence of any numerical errors), convex optimization problem have the guarantee that any local minima is a global minima.

2. The choice of an initial guess is crucial to the quality of a solution in nonconvex optimization.

- (a) true
- (b) false

Solution: True, the initial guess is crucial for determining what local minima the solver will end up in, as well as if it is able to find a feasible solution.

3. The linearized friction cone as shown in lecture conservatively approximates the friction force available for a given normal force.

- (a) true
- (b) false

Solution: True.

4. Iterative Learning Control (ILC) requires an exact dynamics model.

- (a) true
- (b) false

Solution: False, ILC is designed to pair an offline approximate dynamics model with the true dynamics on hardware (that is unknown).

5. Iterative Learning Control (ILC) only works on systems with open loop policies.

- (a) true
- (b) false

Solution: False, it will work with open loop or closed loop policies. It will only optimize over the feedforward control signal though.

6. Any linear system with discrete dynamics  $x_{k+1} = Ax_k + Bu_k$ , and a control policy  $u_k = -Kx_k$ , can be expressed as  $x_{k+1} = \tilde{A}x_k$  with some constant matrix  $\tilde{A}$ .

- (a) true
- (b) false

Solution: True.