ME 327: Design and Control of Haptic Systems
Spring 2020

Interactive Session 16: Teleoperation: Transparency and Stability

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Questions from prerecorded video?

implementation summary

follower robot controller

$$f_{a2}(t) = k_{p2}(x_1 - x_2) + k_{d2}(\dot{x}_1 - \dot{x}_2)$$

master robot controller

unilateral teleoperation:

$$f_{a1}(t) = 0$$

bilateral teleoperation (position-exchange):

$$f_{a1}(t) = k_{p1}(x_2 - x_1) + k_{d1}(\dot{x}_2 - \dot{x}_1)$$

bilateral teleoperation (position forward, force feedback):

$$f_{a1}(t) = f_e$$

Discussion

- what limits the values of the controller gains?
- how do these limitations relate to those of force feedback for virtual environments?
- what are the advantages and disadvantages of position- and force-based bilateral teleoperation?
- what factors might affect transparency?
- what factors might affect stability?

Discuss in breakout groups and report back

Remember your room number

Phantom Omni Teleoperation Demo

Paper presentation/Hands-on demo

5/28	Choose your team (2-3 people)
5/29	Select a paper
6/2 or 6/4	Show simple hands on demo in class
6/2	Record Presentation (submit URL via Canvas)
6/2	Create quiz questions
6/8	View presentations and take quizzes

Enter team info here:
https://tinyurl.com/ME327-Spring2020-Teams

Join your group/team on Canvas

Reminders:

Assignment 7 due today
Assignment 8 will go out Monday 6/1 or earlier

Presentation/Demo teams due today!
Paper selections due tomorrow!
Demo day and a quiz Google form TBA tomorrow

Quiz 3 will be Tuesday, June 9

Office Hours/Q&A with Allison until 10 am
Question queue (see tab with today's date):
https://tinyurl.com/HapticsAllison