nonlinear control systems

lecturers
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objective
The course aims at introducing basic properties of nonlinear systems, fundamental stability notions in nonlinear systems and a set of self-contained results on the control design of nonlinear systems.

contents
Lecture 1 (Introduction to nonlinear systems). During this lecture, the students will be given examples on nonlinear systems, and several fundamental properties and stability notions of nonlinear systems will be introduced.

References

Lecture 2 (Lyapunov stability). The students will learn Lyapunov converse theorem and characterization of input-to-state stability notion.

References


Lecture 3 (Feedback linearization). In this lecture, the students will be introduced to the concept of relative-degree and normal forms. The application of these notions to feedback linearization and for control design will be given.

References

Lecture 4 (Nonlinear control design). During this lecture, the students will learn the backstepping control design approach.

References

lecture notes
The lecture notes will be distributed during the course.

prerequisites
The students are expected to be familiar with ordinary differential equations, linear control systems and linear algebra.

homework assignments
A set of homework assignments will be distributed at the end of each lecture.