

CONTROL THEORY OF PARTIAL DIFFERENTIAL EQUATIONS

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The purpose of these lectures is to give an introduction to some important parts of control theory. The plan of the lectures is as follows:

- (1) A brief overview of finite-dimensional linear control theory.
- (2) A brief introduction to Sobolev spaces and to basic existence theorems for classical PDEs.
- (3) Observation and control of a vibrating string. We introduce some basic problems and results by an elementary (but specific) method via d'Alembert's formula.
- (4) We establish much more general results by applying multipliers and the Hilbert Uniqueness Method of J.L. Lions.
- (5) We establish other natural results on the control of vibrating membranes and plates which resist the multiplier approach. For the proof we apply some techniques of nonharmonic analysis.

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