EE302 - Feedback Systems **Spring 2019**

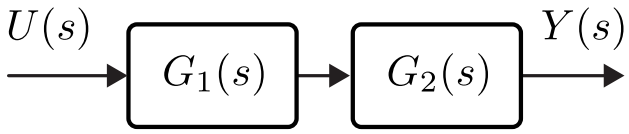
Lecture 4

Lecturer: Asst. Prof. M. Mert Ankarali

4.1 Block Diagrams & Simplifications

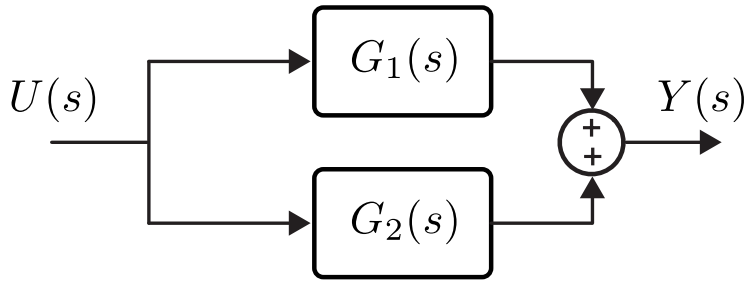
4.1.1 Fundamental Block Diagram Topologies

Cascaded (Series) Block Diagrams



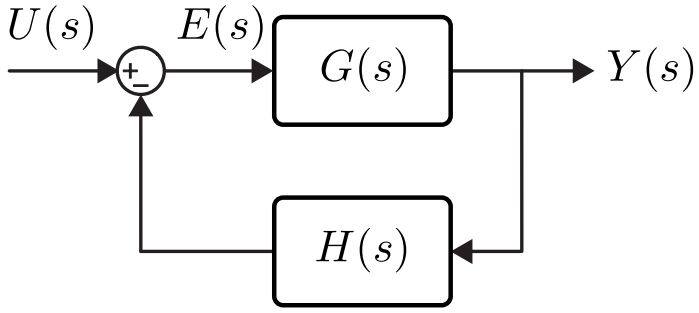
$$\frac{Y(s)}{U(s)} = \bar{G}(s) = G_1(s)G_2(s)$$

Parallel Block Diagrams



$$\frac{Y(s)}{U(s)} = \bar{G}(s) = G_1(s) + G_2(s)$$

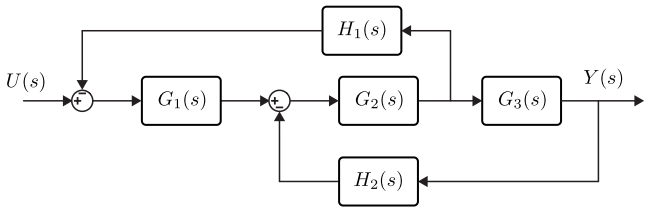
Negative Feedback Loop



$$E(s) = U(s) - H(s)Y(s)$$
$$E(s)\left(1 + H(s)G(s)\right) = U(s)$$
$$\frac{Y(s)}{U(s)} = \bar{G}(s) = \frac{G(s)}{1 + H(s)G(s)}$$

4.1.2 Examples

Ex 1: Simplify the following block-diagram topology



Solution: