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Serge Zacher

## **Bus-Approach for MIMO-Feedback Control**

**New Method of Design for multivariable Systems**

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*This book is first publication  
about bus-approach*



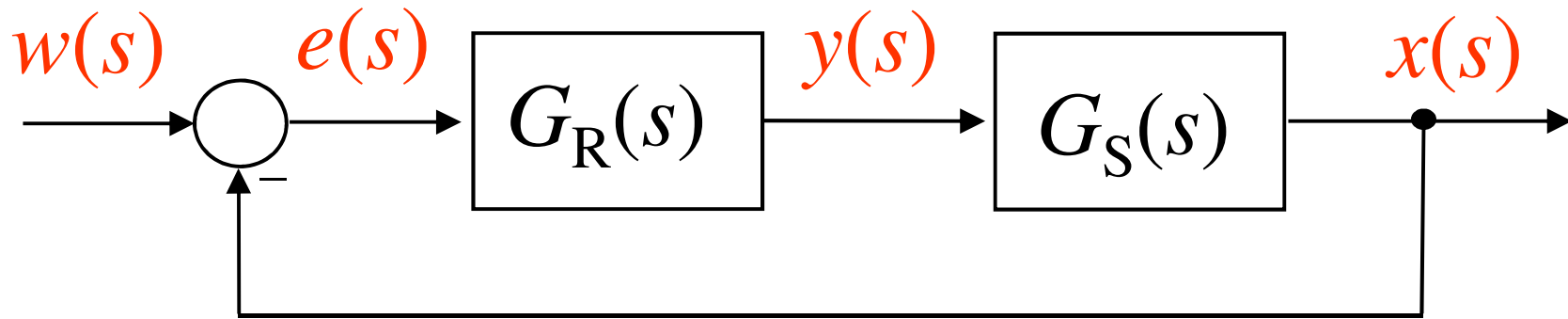
**ZACHER**

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**WHAT is the BUS-APPROACH  
for feedback control?**

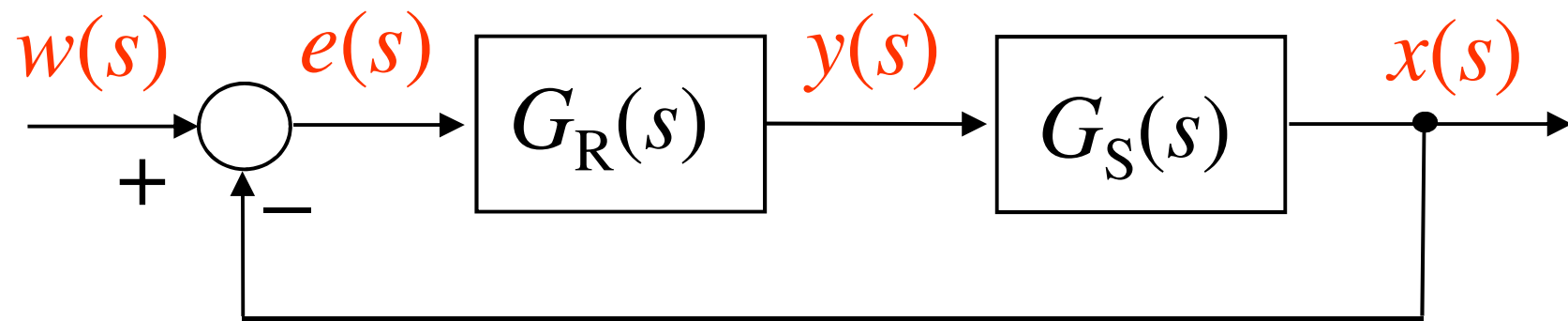
In the literature the **feedback control** is always shown as a **closed loop**.

The simplest loop consists of a **plant** and a **controller**.



**Instead of conventional closed loop proposed Dr. Serge Zacher in his book a **bus-approach**.**

**According to the bus-approach the same blocks of the closed loop, namely, a plant  $G_S(s)$  and the controller  $G_R(s)$ , are connected as a bus modules.**



$x(s)$

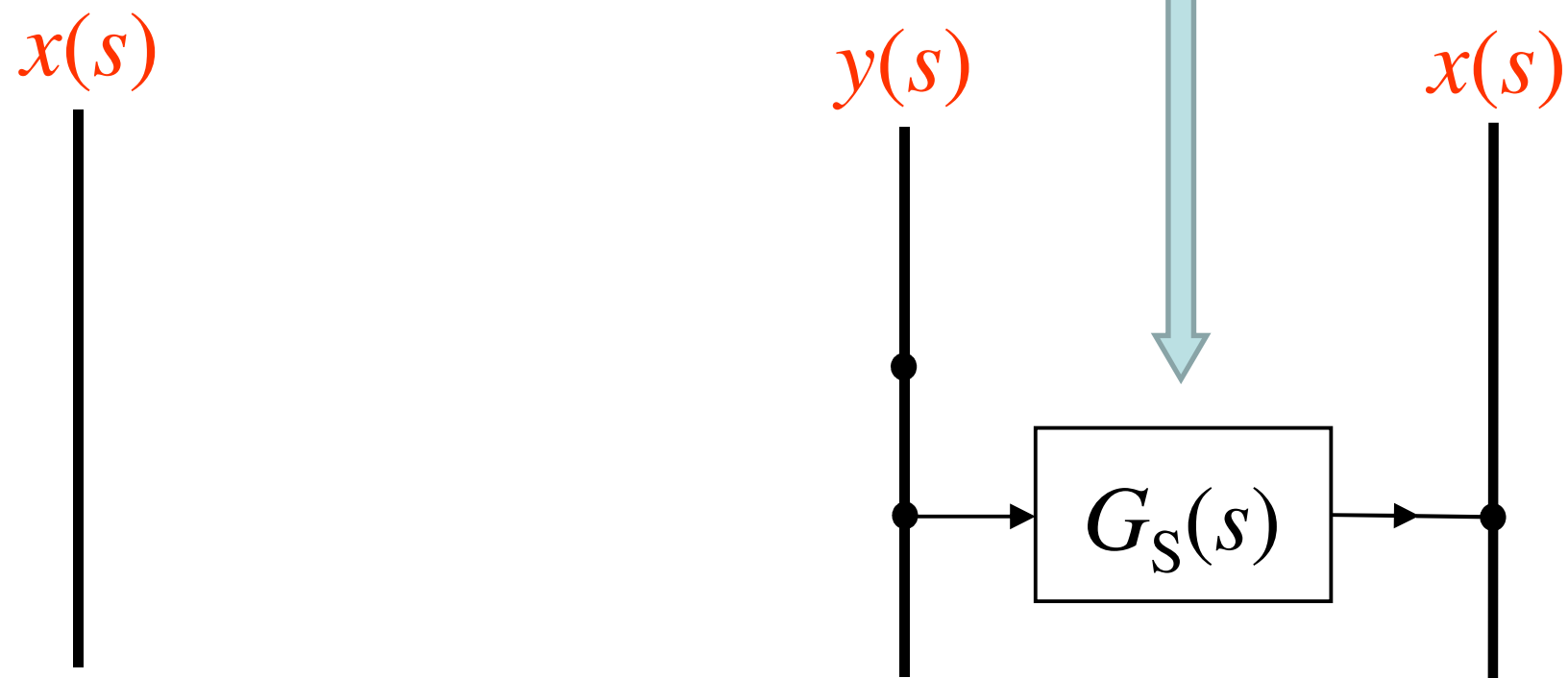
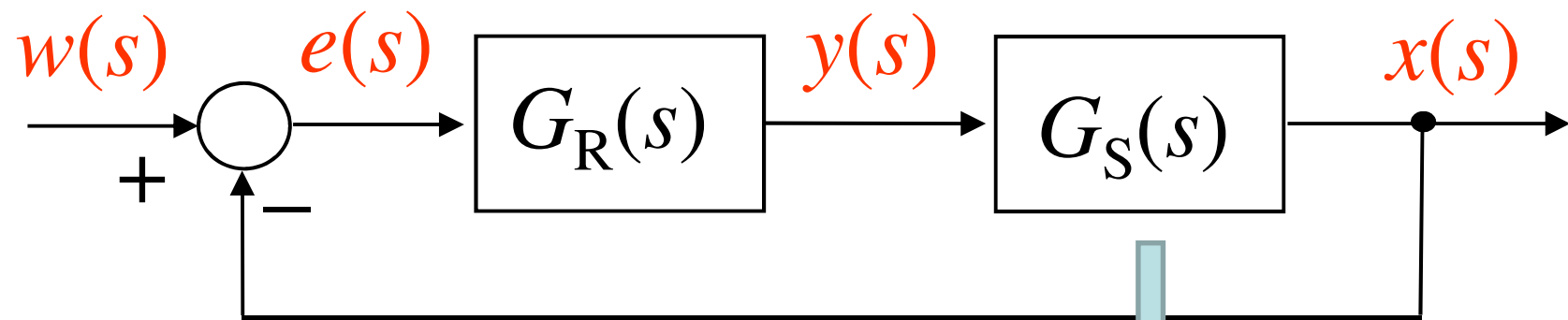


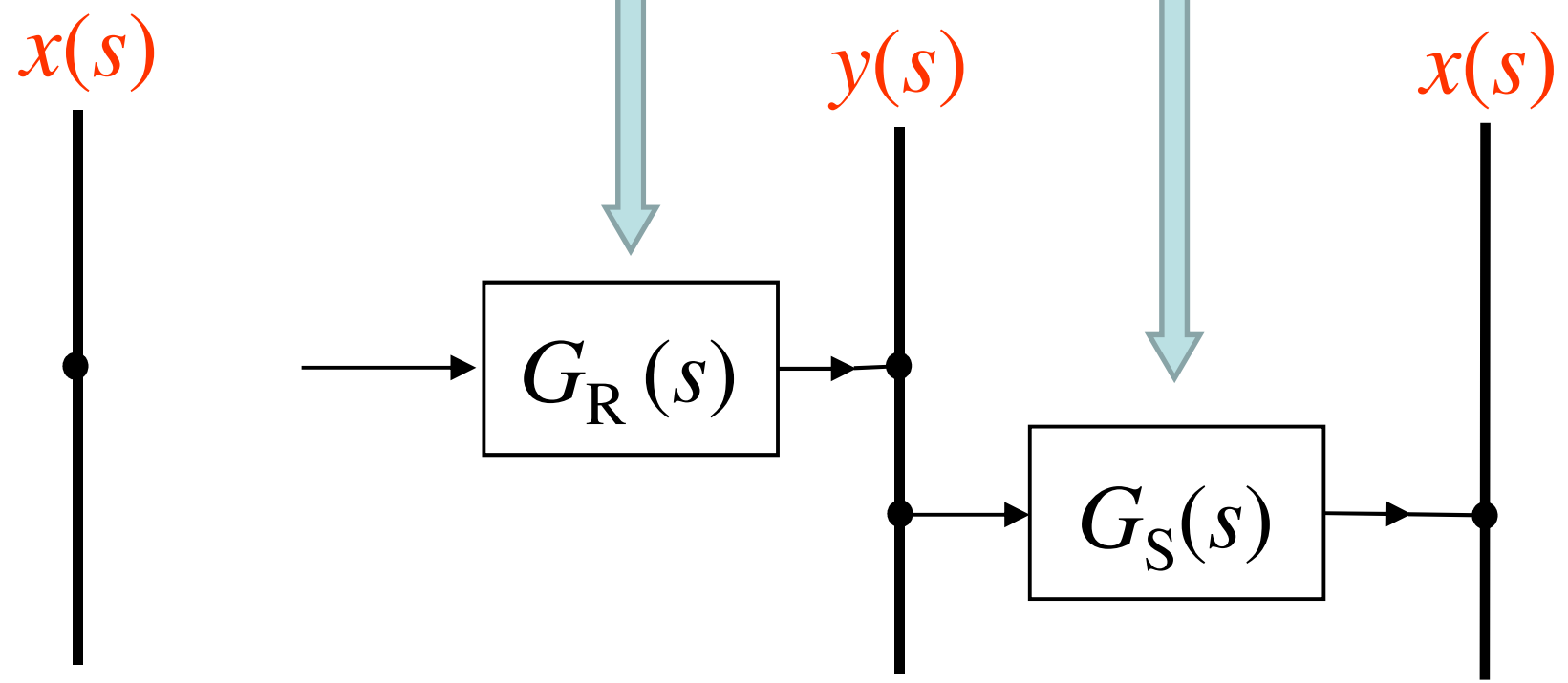
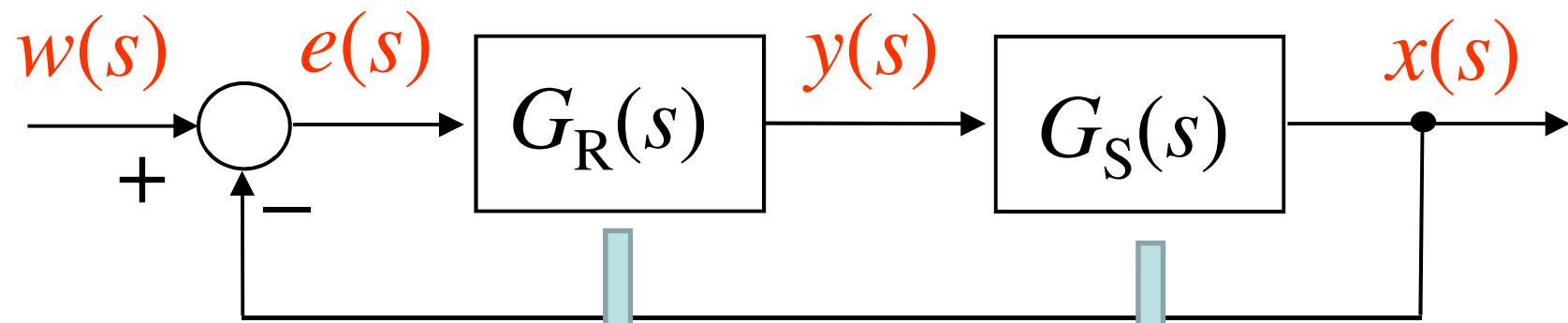
$y(s)$

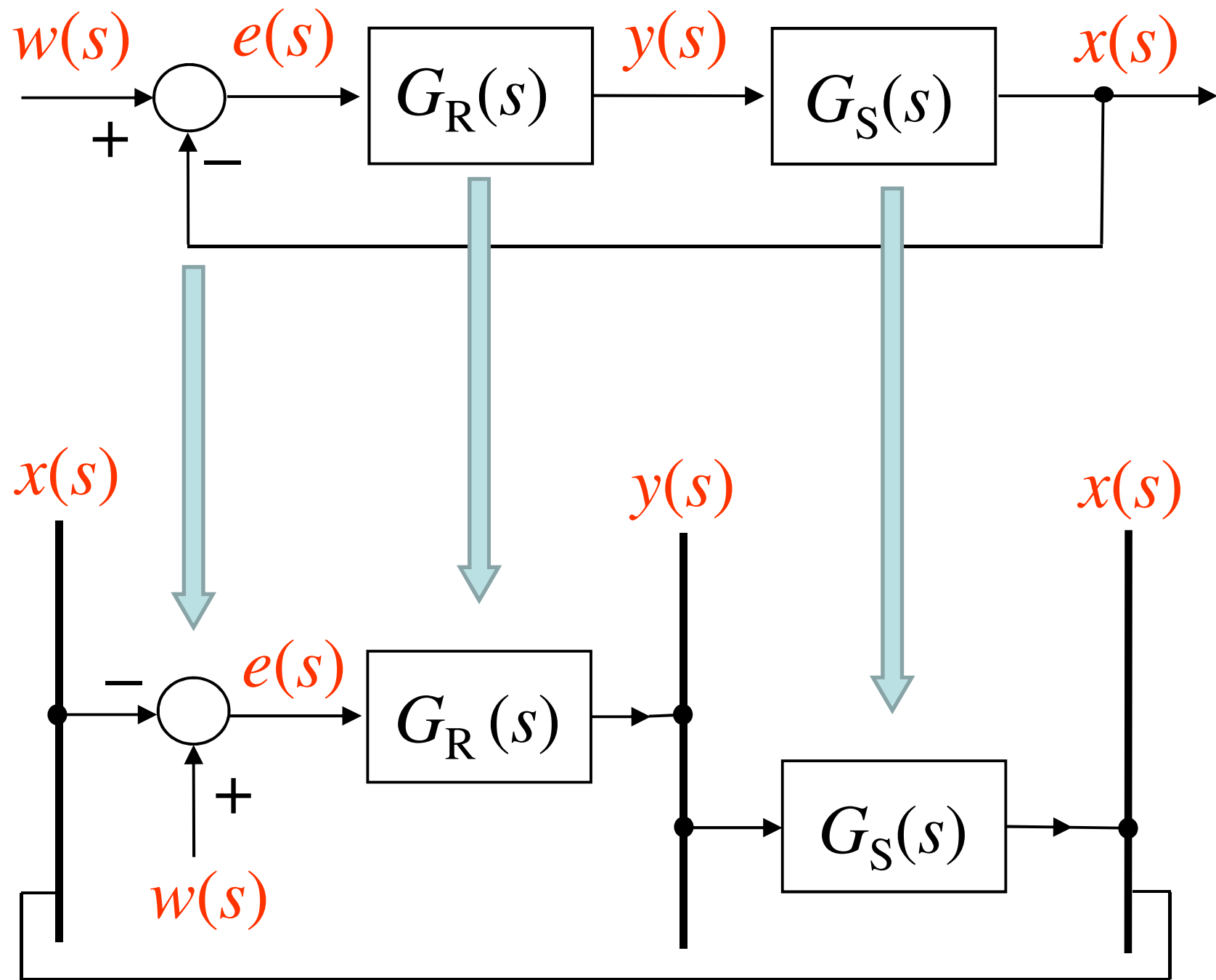


$x(s)$



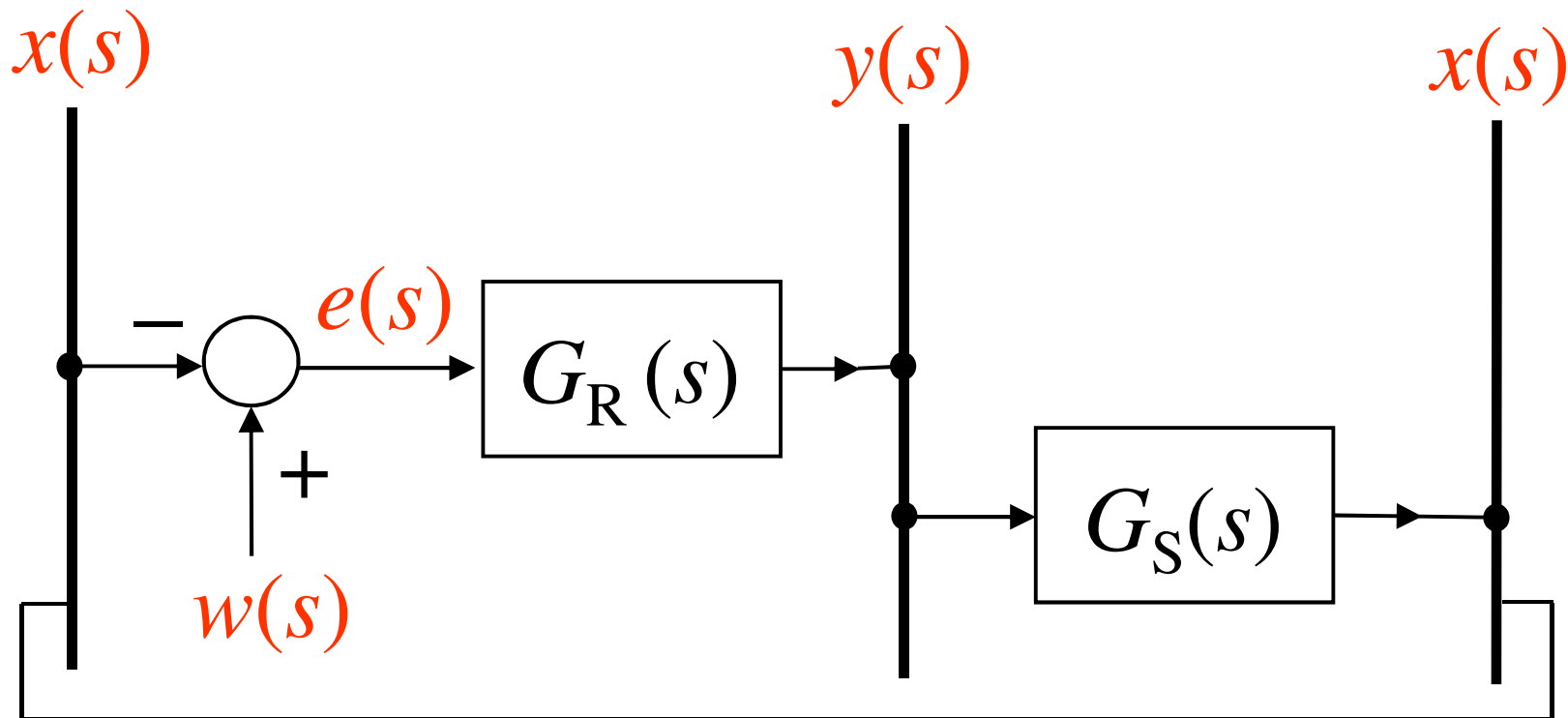






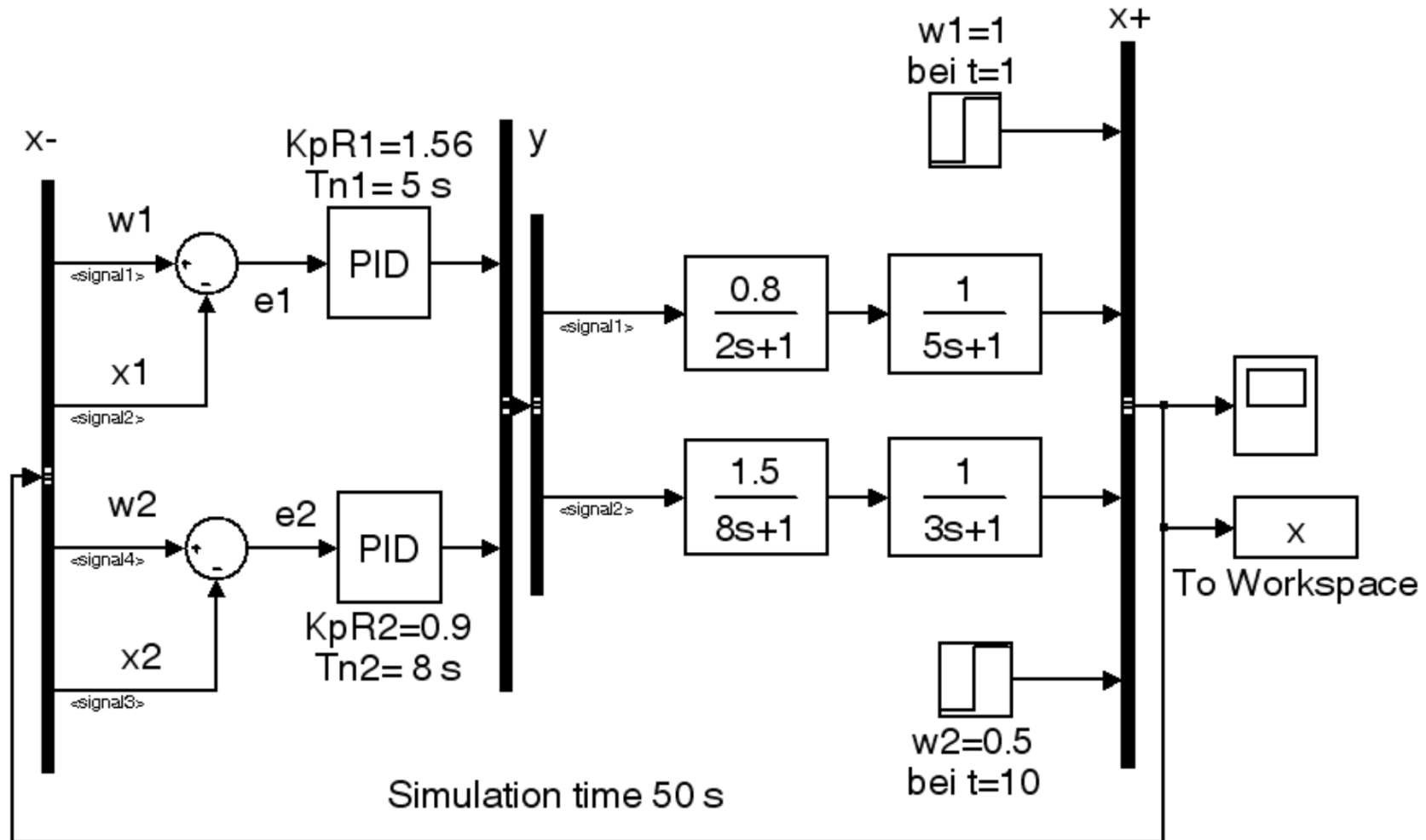


**This different view of the closed loop by the same function of the feedback control brings many advantages.**



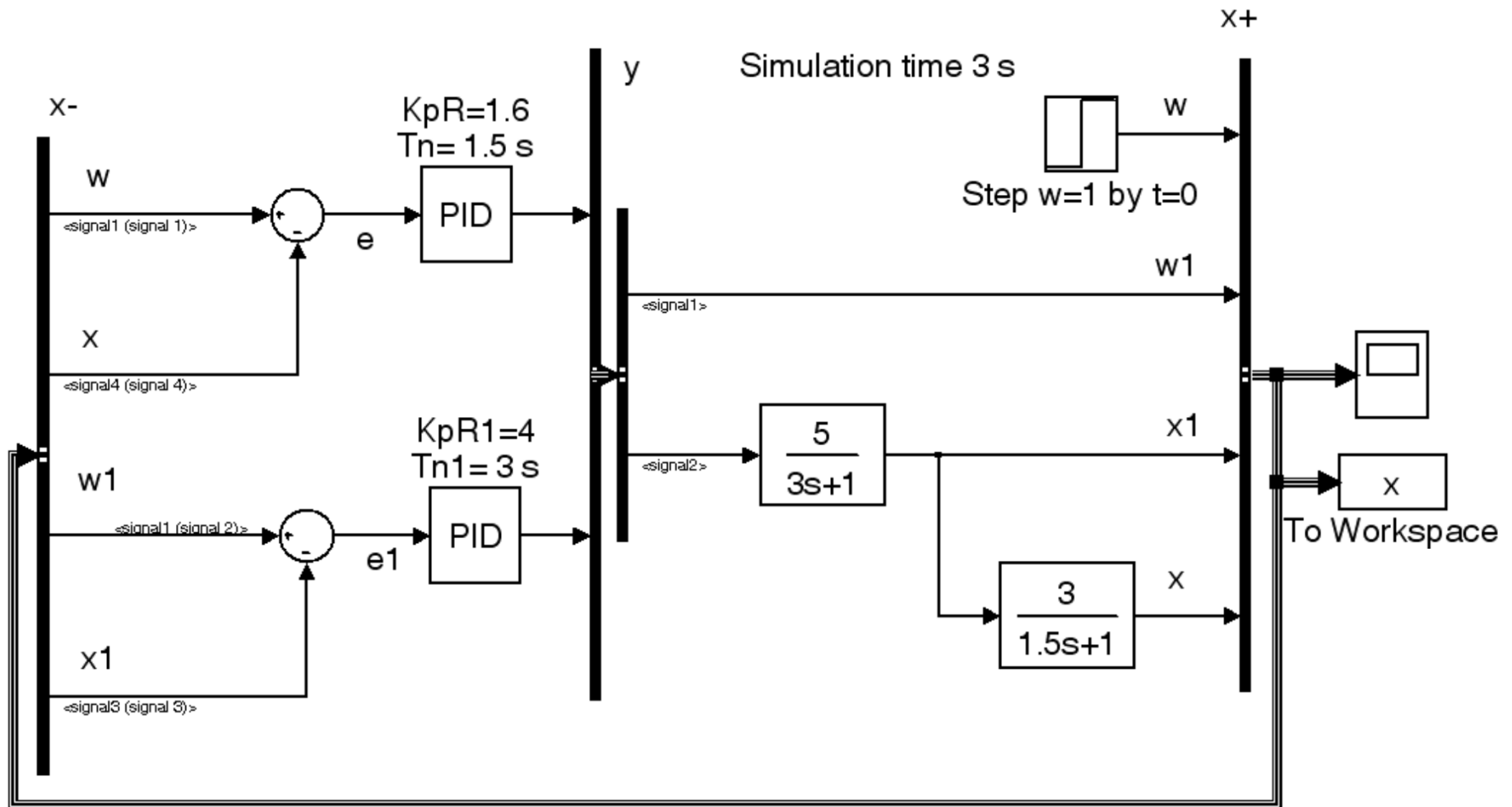
# Advantages of bus-approach:

1. You can connect many controllers to separate plants



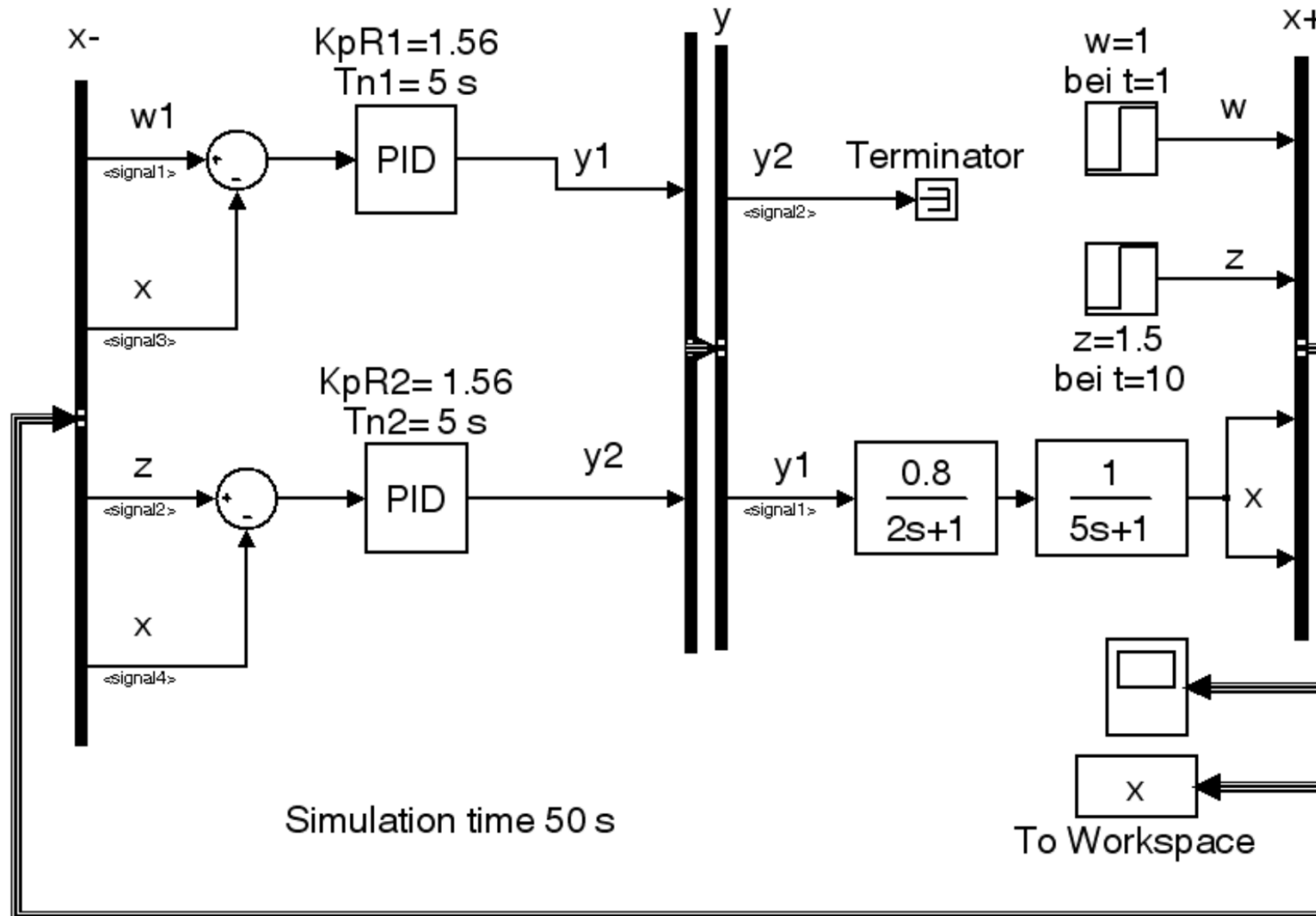
# Advantages of bus-approach:

## 2. You can build the cascade control



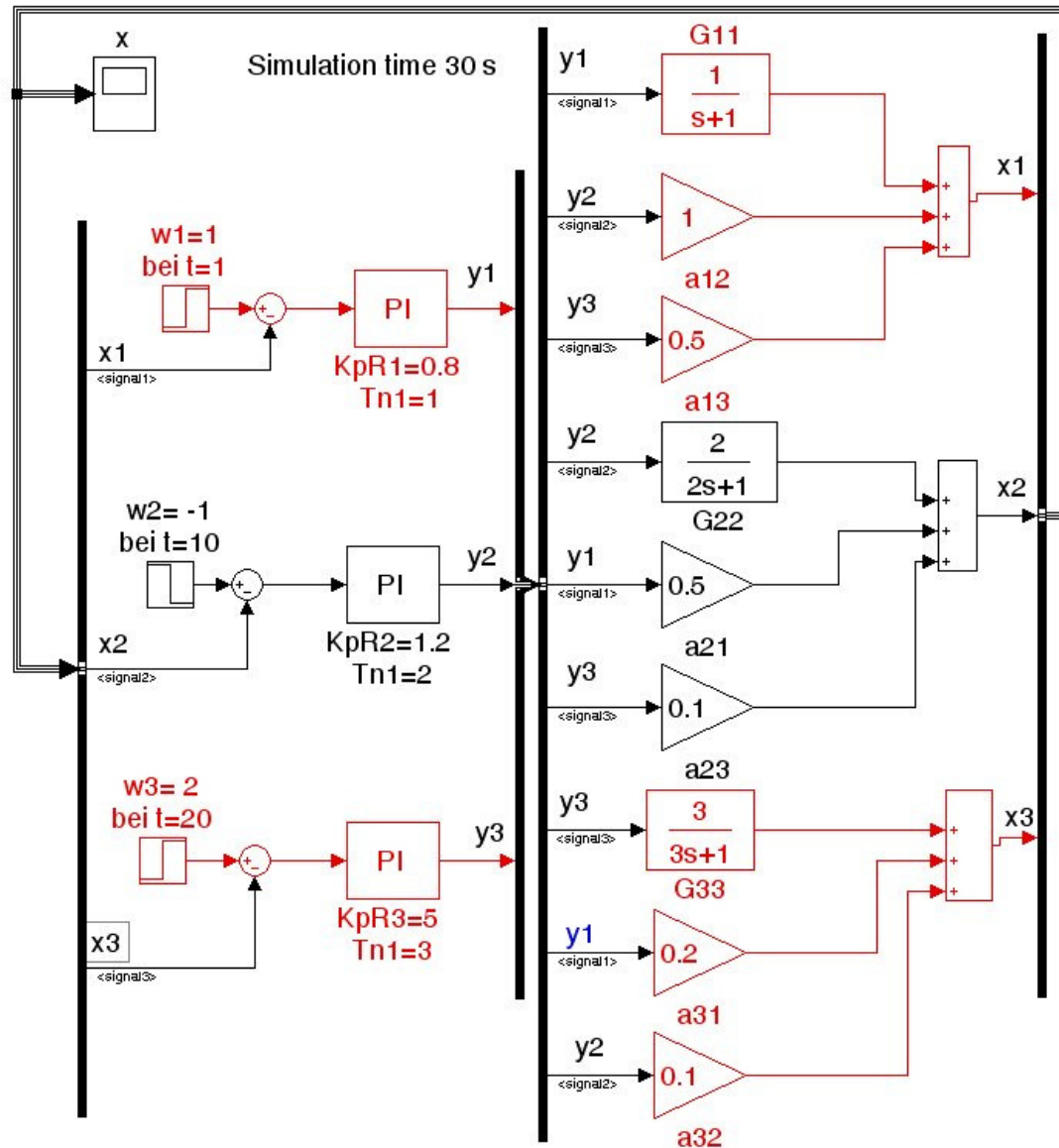
# Advantages of bus-approach:

3. You can realize the redundant control with two controllers



# Advantages of bus-approach:

4. You can realize the multivariable control with many variables



# Compare yourself what is better, the classical loop or the bus-approach

„I am sure that you will be surprised  
how easy is to handle the MIMO-  
systems of second-order or of higher  
order with the bus-approach.

Thank you for your attention.“



*Prof. Dr. Serge Zacher*

*Wiesbaden, 30th of January 2014*