Automatic Control III

Lecture 10 – Summary of the course

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• Signal sizes and gains, singular values
• Small gain theorem and the circle criterion
• Computing poles and zeros for transfer matrices
• Stability – internal stability
• Basic limitations and conflicts – general understanding
• The pairing problem and RGA
• Decentralized and decoupled control
• IMC, $\mathcal{H}_2$ and $\mathcal{H}_\infty$ controllers
• Computing and using linearizations
• Understanding and using phase portraits
• Lyapunov stability
• Describing functions
Summary for life

What should you remember from automatic control?

- The **principles**: Feedback (and feed forward)
- Stability and instability: That they **exist**
- The **possibilities**: Use automatic control where it has never been used before.

The TSTF-principle: **Try Simple Things First**
Summary for life

What should you remember from automatic control?

- The **principles**: Feedback (and feed forward)
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The TSTF-principle: **Try Simple Things First**
Automatic control is used almost everywhere

We have seen many examples where automatic control has been successfully used.

To summarize it is fair to say that automatic control is used almost everywhere, but it is often hidden.

Automatic control is sometimes refereed to as the “hidden technology”.
Related courses – focusing on models

Statistical Machine Learning (see separate presentation)
www.it.uu.se/edu/course/homepage/sml

Data is becoming more and more widely available and we now have more data than we can handle. This course provides an introduction into the area of machine learning. To a large extent this involves probabilistic modeling in order to be able to solve a wide range of problems.

“Machine learning is about learning, reasoning and acting based on data.”

System identification
www.it.uu.se/edu/course/homepage/systemid/vt16
MSc thesis project

Suggestions for MSc thesis work is regularly advertised from

www.it.uu.se/student/thesis_project/links