

MAS601 Design, Modeling and Simulation of Mechatronic Systems

PhD Course in Mechatronics: 21-22.09.2010 and 5-6.10.2010

Guest Lecturer Dr. Hallvard Engja



Figur 1: Campus Grimstad, Jon Lilletun veg 9

Mathematical Modelling and Computer Simulation, Automatic Control Systems and Mechanical Vibration Analysis. He has been a visiting professor at University of California Davis, Technical University Delft, Purdue University Lafayette and University of Michigan, Ann Arbor. Dr. Engja is now retired, but continues to give presentations and guest lectures at universities and colleges in Norway.

1 Practical Information

- Location: Campus Grimstad, Room C4 043
- Lecture 1: September 21, 12:15 - 18:00
- Lecture 2: September 22, 08:00 - 14:00
- Lecture 3: October 5, 12:15 - 18:00
- Lecture 4: October 6, 08:00 - 14:00
- Registration by email to: geir.hovland@uia.no
- No course fee, but limited places
- Required background: Master degree

2 Lecturer Biography

Dr. Hallvard Engja has a Bachelor degree from South Dakota School of Mines, a Master degree from Oklahoma State University and a PhD degree from Purdue University, all in Mechanical Engineering. He has worked with the Norwegian Atomic Institute as a Design Engineer, with General Electric as an Automatic Control Engineer and at DNV in the area of Finite Element software development. Dr. Engja practised Mechatronics Engineering - long before this term was invented. In the period 1971-2001 he worked as a professor of Marine Engineering at NTH/NTNU. He has taught courses in Machinery System Analysis,

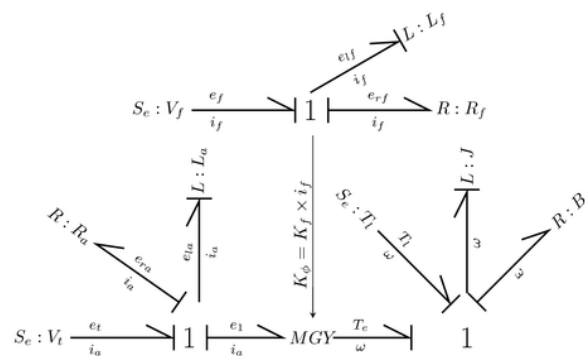


Figure 1: Bond graph model of a DC motor

Figure 2: Bond Graph model of a DC motor.

3 Course Contents

1. Introduction to Systems, Models, Modelling and Simulation
2. Definition of Generalised Variables and Basic Bond Graph Elements
3. Definition of Causality (cause and effect) for the Basic Elements
4. Mechanical System Elements and Modelling
5. Electrical System Elements and Modelling
6. Hydraulic System Elements and Modelling
7. Systematic Development of Equations from the System Bond Graph
8. Simulation
9. From Bond Graphs to Block Diagrams