

## **Abstract**

Bond graph modelling starts from considering the exchange of power between the ports of system components. The methodology makes use of an analogy and a uniform graphical representation across energy domains. Therefore, the methodology is well suited for modelling and analysis of a wide range of engineering systems and processes from controlled mechatronic systems, power electronic systems, energy systems such as fuel cells, thermodynamic systems to chemical reactions in process engineering. Bond graph methodology not only supports a systematic development of models but also enables a graph based analysis of structural properties such as structural observability and structural controllability and can be used for problems such as model-based fault detection and isolation.

The presentation explains and illustrates essential features of the bond graph methodology and will consider its application to a number of small examples from various disciplines. Furthermore, we will look at some ways in which software can be used to support this powerful methodology. The talk concludes by briefly considering trends in current research and developments to be expected in the near future.