

HOMWORK 3

ECE505

d2l: hw03

Due: 28 October 2010

This homework tests your ability to create a well-defined modeling language from example diagrams, and descriptions of the domain.

Introduction

Bond Graphs are domain-independent diagrams that are used to model mechanical, electrical, hydraulic, pneumatic, and thermal systems. What is particularly appealing about bond graphs is that they are modular, allowing component interconnection, and that computer programs can convert them to differential equations or other forms suitable for simulation or compensator/controller design. Unfortunately, freely available bond graph modeling packages tend to use textual input (even though Bond Graphs are an inherently visual language). Please see <http://mtt.sourceforge.net/> for an example of a freely available Bond Graph package. The following figure is an example of a Bond Graph model of a dc motor

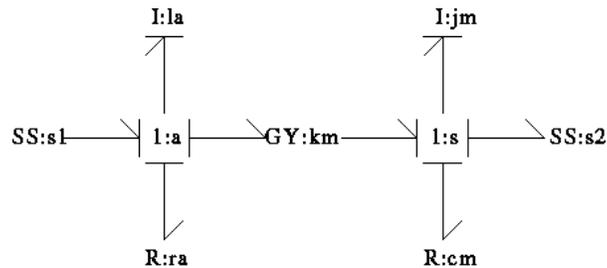


Figure 1: An example Bond Graph.

1 Lingo del Bondo

Create a GME metamodel for a Bond Graph modeling paradigm. You need to research the basic Bond Graph language and ensure your modeling paradigm can be used to model general Bond Graphs (i.e. do not use tool-specific elements in your paradigm). Your modeling paradigm must have features that allow for the management of large Bond Graph models. You also need to provide the icons for the atoms used in your paradigm—remember that presentation is one component of visual modeling languages. *Note: The name of your paradigm should be **BondGraphML**.* Your solution should be in the form of an `xme` export of your metamodel, an `xme` export of an example bond graph model, and your icon files. Feel free to use as an example those included in the mtt documentation (from sourceforge).