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Underlying any engineering application is the use of Numerical Methods. Numerical Methods is a manner in which 'discretization' of solutions can be achieved rather than analytical solutions (eg. integration, differentiation, ordinary differential equations and partial differential equations).

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The numerical analysis of these mixed systems, called differential-algebraic systems, is quite difficult but necessary in order to model moving mechanical systems. Building simulators for cars, planes, and other vehicles requires solving differential-algebraic systems in real time. Another important application is atmospheric modeling. In addition to

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