

The Marshall Differential Analyzer Project

A Visual Interpretation of Dynamic Equations

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The Marshall Differential Analyzer Team is a collection of undergraduate and graduate students gathered together with the express purposes of studying the mechanics of and constructing a four integrator differential analyzer. The machine, being built almost exclusively of replicated Meccano components, is a close model of the first differential analyzer built in England by Dr. Arthur Porter when he was a student of Douglas Hartree at the University of Manchester in the mid 1930s. Finding solutions to nonlinear differential equations is only one of the benefits that the machine has to offer. Like our forefathers, we will certainly utilize this feature. Bringing to life a mathematical statement through the construction and operation of this magnificent and essentially mechanical machine will be its invaluable contribution to the study of dynamic equations.

This talk will begin with a brief chronicle of the Marshall DA Project, which began with a visit to the Londons Science Museum, continued with the construction of our two integrator mini DA (we call her Lizzie), and is currently in the construction phase of our large four integrator machine. A discussion of the basic mechanics of the machine and how it can be programmed to model a dynamic equation will follow.