

Max-Plus Algebra: An Introduction

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Abstract

Max-plus algebra is a research area that is very effective in modeling sequences of events, where events are viewed as sudden changes in a process to be studied. Some examples of events are a message arrives, a train leaves the station, a door opens, and a set of jobs arrive on a set of machines in a typical manufacturing system setting. Usually one is interested in modeling, analysis and timing of such events, subject to synchronization constraints such as a message must have been sent before it can arrive or a certain train should not depart before another train has arrived (to allow changeover of passengers, for instance) or a machine cannot be made available to a new job until the previous job has been completed.

In this talk, I will present a very basic introduction to the field of max-plus algebra with a lot of definitions and several properties that the *max* and *plus* operators satisfy in this algebra. We will also introduce vectors and matrices in this algebra and then study a very simple first model of heaps that can be studied using max-plus algebra.

This talk will be at a level accessible to the typical undergraduate student.