



Centro de Investigação em Matemática e Aplicações
Programa de Doutoramento em Matemática
Departamento de Matemática

Seminário

22 de junho de 2017 quinta-feira
CLAV – Anfiteatro 1 - 10:00 horas

Spectral graph partition: old and new results *Juan-Luis García Zapata*

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Abstract

A distributed application is modeled as a weighted graph, where tasks or processes are the vertices, and the edge between two tasks is weighted by the total volume of communications between them. The problem of graph bi-partitioning is to find, among all possible partitions of the set of tasks into two equal parts, that partition that minimizes communication of one of the two parts to the other. This is of practical interest in mapping tasks to processors of a particular architecture, to take advantage of the communication channels on the machine.

We'll talk about the spectral solution to the problem of bipartition. It is based on the extremal properties of certain eigenvector of the Laplacian matrix of the graph. The presentation will be based on visual and intuitive examples. We also discuss modifications in this classical solution, to incorporate into the graph model a computational load of tasks, perhaps uneven. Also, to do the partition into two parts of predefined volume (for example $1/3$ and $2/3$ of the total load), for mapping to heterogeneous architectures.

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