

Seminário OGTC

Optimization, Graph Theory and Combinatorics

30 de junho de 2021

(16h00–17h00 — Sala Sousa Pinto)

Evento Online:

<https://videoconf-colibri.zoom.us/j/85702945358>

Meeting ID: 857 0294 5358 No password required.

Spectral results of a class of circulant matrices

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Abstract

A circulant matrix of order n , is a square matrix of the form:

$$C = \begin{pmatrix} a_0 & a_1 & a_2 & \cdots & a_{m-1} \\ a_{m-1} & a_0 & a_1 & \cdots & a_{m-2} \\ a_{m-2} & a_{m-1} & a_0 & \cdots & a_{m-3} \\ \vdots & \vdots & \vdots & & \vdots \\ a_1 & a_2 & a_3 & \cdots & a_0 \end{pmatrix}. \quad (1)$$

and usually denoted as $C = \text{circ}(c_0, c_1, \dots, c_{m-1})$. It is evidently determined by its first row. The spectrum of these matrices and their eigenvectors are well known. Furthermore, the *circulants* form a linear subspace of the set of all matrices of order n . Then, it is natural to wonder which other structures have all the interesting properties than those from circulant matrices.

In this talk we will see some generalizations of the circulating structure and we will see which properties of the circulating structure are preserved and which are not.

References:

E. Andrade, L. Arrieta, C. Manzaneda, M. Robbiano, On the spectra of some g-circulant matrices and applications to nonnegative inverse eigenvalue problem, *Linear Algebra and its Applications* 590 (2019) 1-21.

E. Andrade, D. Carrasco, C. Manzaneda, On circulant like matrices properties involving Horadam, Fibonacci, Jacobsthal and Pell numbers, *Linear Algebra and its Applications* 617 (2021) 100-120.

This seminar is supported by The Center for Research and Development in Mathematics and Applications (CIDMA) through the Portuguese Foundation for Science and Technology (FCT - Fundação para a Ciência e a Tecnologia), reference UIDB/04106/2020.

