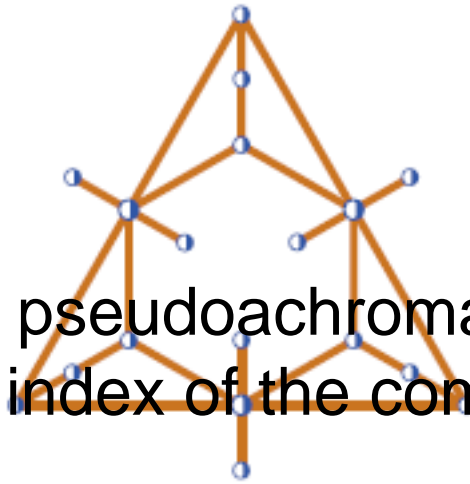


Bled'11 - 7th Slovenian International Conference on Graph Theory



Contribution ID : 142

On the pseudoachromatic and achromatic index of the complete graph

Content :

Let G a simple graph. A colouring of its vertices $\sigma: V \rightarrow \{1, \dots, k\}$ is called **complete** if each pair of different colours appears in a edge. The **pseudoachromatic number** $\psi(G)$ is the maximum k for which there exist a complete colouring of G . If the colouring is required also to be proper (i. e., that each chromatic class is independent), then such a maximum is know as the **achromatic number** and it will be denoted here by $\alpha(G)$.

We are mainly interested in the pseudoachromatic number $\psi(n) := \psi(L(K_n))$ of the complete graph's line graph - also know as the **pseudoachromatic index** of the complete graph- and its relation with the **achromatic index** $\alpha(n) := \alpha(L(K_n))$.

In this talk, we expose the principal motivation of this research, a deep result due to Bouchet in 1978: Let q be an odd natural number, and let $m = q^2 + q + 1$. A projective plane \mathbb{P}_q of order q exists if and only if $\alpha(m) = m$.

Also, we expose our work made in this direction: In a recently paper, my coauthors proved that $\psi(n) = q(n+1)$ when $n = q^2 + 2q + 2$ and $q = 2^\gamma$ for $\gamma \in \mathbb{N}$ using also the properties of the projective planes.

Now, we have shown that $\psi(n-a) = \alpha(n-a) = q(n-2a)$ when $n = (q+1)^2$, $q = 2^\gamma$ for $\gamma \geq 2$ and $a \in \{0, 1, 2\}$ using also projective planes.

Primary authors : Mr. RUBIO-MONTIEL, Christian (Instituto de Matematicas, UNAM, Mexico)

Co-authors : Dr. MONTELLANO-BALLESTEROS, J. José (Instituto de Matematicas, UNAM, Mexico) ; Dr. STRAUZ, Ricardo (Instituto de Matematicas, UNAM, Mexico) ; Dr. ARAUJO-PARDO, M. Gabriela (Instituto de Matematicas, UNAM, Mexico)

Presenter : Mr. RUBIO-MONTIEL, Christian (Instituto de Matematicas, UNAM, Mexico)

Session classification : --not yet classified--

Track classification : General session

Type : Oral presentation