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D. Cvetković, P. Rowlinson and S. Simić
Eigenspaces of Graphs
Encyclopedia of Mathematics and its Applications Vol. 66
Cambridge University Press
ISBN 978-0-521-57352-8 (hardback, 1997), 978-0-05718-9 (paperback, 2008)

With acknowledgements to E M. Li Marzi, Wen Bin and the late F. K. Bell.

p.3 line 10: The index is a simple eigenvalue with a positive eigenvector if and only if .....

p.26 line −10: result

p.31 line −8: associative

p.37 line −10: $\lambda_{n-m+i} \leq \nu_i \leq \lambda_i$

p.69 line −7: $t = d - 1$

p.73 line −3: $(5, 80, 85)$, $(6, 60, 69)$, $(8, 68, 88)$

p.80 line −1: $\mathcal{S} = \mathcal{E}(\mu_i)$

p.93 line −11: $S_2 = D^{-1} S_1 D$

p.95 line −6: $k \in \mathbb{N}$

p.98 line 9: orthogonal

p.135 line 9: replace $>$ with $<$

p.152 line 14: (7.1.2)

p.156 line −10: *form*

p.167: delete edge 67 from Fig. 7.4

p.179 line −4: solid edges

p.179 line −3: broken edges

p.206 line −6: corresponding

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D. Cvetković, P. Rowlinson and S. Simić
Spectral Generalizations of Line Graphs
LMS Lecture Note Series Vol. 314
Cambridge University Press
ISBN 0521-83663-8 (paperback, 2004)

With acknowledgements to Bit-Shun Tam and G. R. Vijayakumar

p.8 line 21: Proposition 1.1.10. Suppose that G is r-regular and $U \subseteq V(G)$. Let $\bar{U} = V(G) \setminus U$. Then G_U is r-regular if and only if U induces a k-regular graph and $\bar{U}$ induces an h-regular graph, with $|U| = 2(r-h)$ and $|\bar{U}| = 2(r-k)$.

p.36 line 5: To ensure orthogonality of U, we may take $\hat{H}$ to be a tree with one petal added; this follows from Lemma 2.3.11. However the proof of Lemma 2.3.7 is incomplete because the GLG determined by R_i may have components that are trees. The assertion of Lemma 2.3.7 remains true in view of Corollary 2.3.17, which is proved independently.

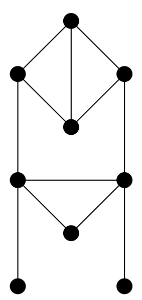
p.42 line 7: in the other

p.87 line 17: The proof of Corollary 3.7.2 is incomplete because Lemma 3.7.1 does not necessarily apply when d vectors determine a graph with $\lambda > -2$. (A similar remark applies to Corollary 4.2 of [CvDS2].) However Corollary 3.7.2 follows from Corollary 2.3.17.

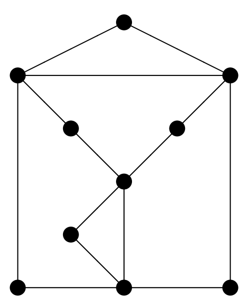
p.129 line 18: [Card]

p.138 line 9: star complement H'

p.185: the 4th graph in Fig. 7.12b should be



p.185: the 5th graph in Fig. 7.12b should be



p.188 line 5: $i_{11} = 113$

p.291 line 16: *Information Processing Letters* 2(1973), 108-112.

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D. Cvetković, P. Rowlinson and S. Simić
An Introduction to the Theory of Graph Spectra
LMS Student Texts Vol. 75
Cambridge University Press
ISBN 978-0-521-11839-2 (hardback, 2009), 978-0-521-13408-8 (paperback, 2009)

With acknowledgements to M. Andjelić, K. T. Balińska, D. Evans, A. Khaleghi, J. T. Saccoman

p.20 line 7: The argument fails because S and T are not symmetric; a proof of Proposition 1.3.16 follows.

Let $M\mathbf{z} = \lambda_1(M)\mathbf{z}$, where $\mathbf{z} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \end{bmatrix}$ and $\|\mathbf{z}\| = 1$. Then

$$\lambda_1(M) = \mathbf{z}^\top M\mathbf{z} = \mathbf{x}^\top P\mathbf{x} + 2\mathbf{x}^\top Q\mathbf{y} + \mathbf{y}^\top R\mathbf{y},$$

whence

$$\lambda_1(M) \leq \lambda_1(P)\mathbf{x}^\top\mathbf{x} + 2\mathbf{x}^\top Q\mathbf{y} + \lambda_1(R)\mathbf{y}^\top\mathbf{y}. \qquad (1)$$

If $\mathbf{x}$ and $\mathbf{y}$ are non-zero let $\alpha = \|\mathbf{y}\|/\|\mathbf{x}\|$, $\beta = \|\mathbf{x}\|/\|\mathbf{y}\|$, $\mathbf{u} = \begin{bmatrix} \alpha\mathbf{x} \\ -\beta\mathbf{y} \end{bmatrix}$. Then $\alpha\beta = 1$, $\|\mathbf{u}\|^2 = \alpha^2\|\mathbf{x}\|^2 + \beta^2\|\mathbf{y}\|^2 = 1$ and

$$\lambda_n(M) \leq \mathbf{u}^\top M\mathbf{u} = \alpha^2\mathbf{x}^\top P\mathbf{x} - 2\alpha\beta\mathbf{x}^\top Q\mathbf{y} + \beta^2\mathbf{y}^\top R\mathbf{y}.$$

Hence

$$\lambda_n(M) \leq \alpha^2\lambda_1(P)\mathbf{x}^\top\mathbf{x} - 2\mathbf{x}^\top Q\mathbf{y} + \beta^2\lambda_1(R)\mathbf{y}^\top\mathbf{y}. \qquad (2)$$

Adding Equations (1) and (2), we obtain $\lambda_1(M) + \lambda_n(M) \leq \lambda_1(P) + \lambda_1(R)$.

If $\mathbf{y} = \mathbf{0}$, then $\lambda_1(M) = \mathbf{x}^\top P\mathbf{x} \leq \lambda_1(P)$, while for any unit vector $\mathbf{w} = \begin{bmatrix} \mathbf{0} \\ \mathbf{v} \end{bmatrix}$, we have

$$\lambda_n(M) \leq \mathbf{w}^\top M\mathbf{w} = \mathbf{v}^\top R\mathbf{v} \leq \lambda_1(R).$$

Similarly, if $\mathbf{x} = \mathbf{0}$ then $\lambda_1(M) \leq \lambda_1(R)$ and $\lambda_n(M) \leq \lambda_1(P)$.

p.24 line 14: Section 2.3

p.25 line 17: $(-1 - \lambda_i)\mathbf{x}_i$

p.73 line 11: $\frac{1}{2}(e - f \pm \sqrt{\Delta})$

p.76 line 14: $r \geq k$, while ... ... then $r \geq l$

p.93 line -3: The paper cited should be: J. B. Shearer, On the distribution of the maximum eigenvalues of graphs, *Linear Algebra Appl.* 114/115 (1989), 17-20.

p.114 line -2: $m+n-2, m-2, n-2, -2$

p.114 line -1: Theorems 2.1.8 and 2.4.2

p.115 line 2: Corollary 3.2.2 and Theorem 3.3.1

p.193 line 3: A correction to the reference [HaKe] appears in a paper by S. Bleiler *et al*, *Australasian J. Comb.* 37 (2007), 205-213.

p.241 line -4: The paper cited should be: M. Hofmeister, Spectral radius and degree sequence, *Math. Nachr.* 139 (1988), 37-44.

p.242 line -5: $\lambda_1(G) - \bar{d} > \dfrac{1}{n(\Delta + 2)}$ (8.16) p.255 line -1: in the table, replace 236 with 325

p.256 line 4: [BaKSZ1]

p.286 line 7 (also p.285 line 3): Table A1 shows the spectra of the adjacency matrix, Laplacian, signless Laplacian and Seidel matrix.