and a ship of To Prove: f is the eigenvector of C with second highest eigenvalue Proof: 0. 15 prime & an is pritted For minimising the reconstruction error of N vectors projected on e and f directions, following constraint is satisfied: where $J(e,f) = f^{T}cf - \lambda, (f^{T}f-1) - \lambda_{2}f^{T}e$ (where 7, and 2, are lagrange multipliers) which implies of is originally of c s to other open one on the sine to all Mincf = 2, f = 2e = 0 bro to Apremultiplying et so war for sulvages et Cf - 2 et - 12 = 0 (ete=1) we know $Ce = \lambda e$ pre and post multiply by e^{T} $e^{T}C = \square \lambda e^{T}$ eTLf = retf

ance elfouropettode of good of from (1), etcf = herf = 0 -3 Putting 3 in 1) & winy etf =0, For minimising the Garage surtice cases of N yedens projected on e and of discitorens Using the sine & mother privated of K - (1-17) KCf= +20,f = (+,0)E (where is, and is one logicipe multiplies. Which implies f is eigenvector of c. SL. Since all non zero eigenvalues of C are distinct and e is eigenvalue with highest 6 ergenvalue, f must be ergenvecta muith second highest - eigenvolve -(1 - 5) we know ce= he pre and postmerpy by er 15 E3 - 27 E3 ACT e76.4= 20-1

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