

BASIC STRUCTURES OF SSA

- Initial configuration (TUG A3.2)
 - Random(co-ordinates)
 - Metric (data=distances)-> scalar-products -> PCA (classic scaling, Torgerson)
 - Quasi-nonmetric (rank/maxrank -> C -> PCA (uses no interval information. GLR) (use 1st r dimensions)
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Distances, Disparities ... Stress

- Distances in current config. are calculated
 - Find disparities (transformed data):
 - Guttman (strong monotonicity; Rank-image)
 - Kruskal (weak monotonicity; BFMF – monotone regression)
 - Calculate Stress (BADNESS of fit)
 - Discrepancy between disparities & current distances
... if not acceptably low, go on to ...
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Correction & Improvement

- Look at each point and its residuals
 - Treat each residual ($\hat{d}$) as a vector (direction; size) from that point
 - Move it in the direction of greatest improvement (sum of vectors) ...
 - But then move them all at once ...
 - And make a decision about how far (step-size) to move ... over-shoot vs under-shoot
- ... *Parachuted aviator lands in dark & thick mist on mountains and needs to reach the valley ... what does he do? (Kruskal & Wish)*

At the end ...

- If stress has diminished enough ...
 - Rotate “final” configuration to principal components (for convenience)
 - ASSESSING ...
 - Compare achieved stress with random (Spence simulation)
 - Point contribution to stress
 - Look at Shepard Diagram ... before solution!
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