

## Structure Preserving Perturbations and Distance Problems: A decade of work with Volker Mehrmann

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Much of Volker Mehrmann's work in control theory and mathematical modelling is associated with solutions of challenging eigenvalue problems. Very often, the challenge is the result of the fact that the matrices involved in the problems have some special structure resulting in eigenvalues that are symmetrically placed with respect to some subset in the complex plane. Eigenvalues belonging to these subsets are called critical eigenvalues as they do not conform to the existing eigenvalue symmetry and their movements are restricted by some additional attributes called sign characteristics. Existence of critical eigenvalues can pose significant computational challenges and undesirable physical phenomena like loss of passivation [1]. Volker Mehrmann is among the early researchers to acknowledge the importance of analysing the effect of structure preserving perturbations on such eigenvalue problems and their role in the solutions of certain 'distance problems' that often arise in applications.

This talk will present some of the challenging distance problems that were tackled in [1] and [2] from the point of view of structure preserving perturbation analysis. Similar analysis has been used to solve other classes distance problems in [3] and [4]. A brief overview of these will also be given.

## References

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