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143 Hw #3

Problem 1 Read the paper "The Geometry of Algorithms with Orthogonality Constraints" which demonstrates how to unify seemingly different algorithms using techniques of Stiefel and Grassmann manifolds. Pick two subsections from section 4.1,..., 4.10. and find at least four papers of various applications for your two sections.

- 4.5. Conjugate gradient for the generalized eigenvalue problem.
- 4.6. Electronic structures computations.

Solution: For Section 4.5:

- *The trace minimization method for the symmetric generalized eigenvalue problem.*
- *Conjugate Gradient Eigenstructure Tracking for Adaptive Spectral Estimation.*

For Section 4.6:

- *Solution of Schrodinger's equation for large systems.*
- *Calculation of the vacancy formation energy in energetics in aluminium.*

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