

数学与系统科学研究院

计算数学所学术报告

报告人: Prof. Zaiwen Wen

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报告题目:

**Regularized Newton Type Methods  
for Riemannian Optimization**

邀请人: 周爱辉 研究员

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上午 10:00-11:00

报告地点: 数学院南楼七层

702 教室

## **Abstract:**

Optimization on Riemannian manifold widely arises in eigenvalue computation, density functional theory, Bose-Einstein condensates, low rank nearest correlation, etc. We propose an adaptive regularized Newton Type method which approximates the original objective function by the second-order Taylor expansion in Euclidean space but keeps the Riemannian manifold constraints. In particular, we are interested in applications that the Euclidean Hessian consists of a computational cheap part and a significantly expensive part. Our basic idea is to keep these parts of lower computational costs but substitute those parts of higher computational costs by the limited-memory quasi-Newton update. The initial quasi-Newton matrix is further constructed from a limited-memory Nystrom approximation to the expensive part. Both global convergence and superlinear local convergence rate are guaranteed under mild conditions. Our algorithm is very promising in extensive experiments compared with a few state-of-art methods.

**欢迎大家参加！**