

# Nachuan Xiao

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## Education

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**Academy of Mathematics and Systems Sciences  
Chinese Academy of Sciences, Beijing, China**

**September 2016 – June 2021**

*Ph.D. in Computational Mathematics*

Advisor : Prof. Ya-xiang Yuan

**School of Mathematical Science  
Fudan University, Shanghai, China**

**September 2012 – June 2016**

*B.S. in Mathematics*

## Academic Experience

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**Institute of Operations Research and Analytics (IORA)  
National University of Singapore, Singapore**

**August 2021 – present**

*Research Fellow*

Advisor : Prof. Kim-Chuan Toh

## Research Interests

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- Optimization problems on Stiefel manifold
- Optimization problems on Riemannian manifolds
- Nonsmooth optimization

My research interests include numerical methods for optimization problems on Riemannian manifolds, especially the optimization problems on Stiefel manifold. I am also interested in nonsmooth optimization problems with orthogonality constraints and their applications arisen from statistics and computer vision.

## Publications

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1. **Nachuan Xiao**, Xin Liu, and Ya-xiang Yuan. A class of smooth exact penalty function methods for optimization problems with orthogonality constraints. *Optimization Methods and Software*, 0(0):1–37, 2020. (link)
2. **Nachuan Xiao**, Xin Liu and Ya-xiang Yuan, Exact Penalty Function for  $\ell_{2,1}$  Norm Minimization over the Stiefel Manifold, *SIAM Journal on Optimization* (accepted). (link)
3. **Nachuan Xiao**, Xin Liu and Ya-xiang Yuan, A Penalty-free Infeasible Approach for a Class of Nonsmooth Optimization Problems over the Stiefel Manifold, (under review). (link)
4. **Nachuan Xiao** and Xin Liu, Solving Optimization Problems over the Stiefel Manifold by Smooth Exact Penalty Function, (under review). (link)

## Presentations

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- The 17th Annual Meeting of China Society for Industrial and Applied Mathematics, 2019.09, Foshan, China
- The 12th International Conference on Numerical Optimization and Numerical Linear Algebra, 2019.04, Shangrao, China

## Honors & Awards

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- Second Prize in Tianchi Competition on Algorithm Design for Fabric Packing Problems (2/832)
- Excellence Award in Alibaba Global Mathematics Competition, 2018

## Skills

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- **Programming:** Matlab, Python,  $\text{\LaTeX}$