Tianxiang LIU

Curriculum Vitae

Research Interests

Nonconvex Optimization: Algorithm and Analysis

Education

Sept.2010–Jul.2015 **Master and Ph.D.**, *Computational Mathematics, Academy of Mathematics and Systems Science, Chinese Academy of Sciences*, Beijing.
Supervisor: Prof. Yu-Hong Dai

Sept.2006–Jul.2010 **Bachelor**, *Computational Mathematics, Wuhan University*, Wuhan.

Work Experience

Apr.2021–Now **Assistant Professor**, *Tokyo Institute Technology*, Tokyo.
山下研究室

Sept.2018–Mar.2021 **Postdoctoral Researcher**, *RIKEN AIP Center*, Tokyo.
Mentor: Prof. Akiko Takeda

Mar.2016–Aug.2018 **Postdoctoral Fellow**, *The Hong Kong Polytechnic University*, Hong Kong.
Mentor: Prof. Ting Kei Pong

Preprints

[1] **Tianxiang Liu**, Ting Kei Pong and Akiko Takeda. Doubly majorized algorithm for sparsity-inducing optimization problems with regularizer-compatible constraints. *Submitted July 2022*.

Publications

[1] **Tianxiang Liu** and Bruno F. Lourenço. Convergence analysis under consistent error bounds. *To appear in Found. Comput. Math.*, 2022.

[2] **Tianxiang Liu** and Akiko Takeda. An inexact successive quadratic approximation method for a class of difference-of-convex optimization problems. *Comput. Optim. & Appl.* 82, 2022, pp. 141-173.

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[3] **Tianxiang Liu**, Ivan Markovsky, Ting Kei Pong and Akiko Takeda. A hybrid penalty method for a class of optimization problems with multiple rank constraints. *SIAM J. Matrix Anal. A.* 41, 2020, pp. 1260-1283.

[4] Ivan Markovsky, **Tianxiang Liu** and Akiko Takeda. Data-driven structured noise filtering via common dynamics estimation. *IEEE Trans. Signal Process.*, 68, 2020, pp. 3064-3073.

[5] **Tianxiang Liu**, Ting Kei Pong and Akiko Takeda. A refined convergence analysis of pDCA$_e$ with applications to simultaneous sparse recovery and outlier detection. *Comput. Optim. & Appl.* 73, 2019, pp. 69-100.

[6] **Tianxiang Liu**, Zhaosong Lu, Xiaojun Chen and Yu-Hong Dai. An exact penalty method for semidefinite-box constrained low-rank matrix optimization problems. *IMA J. Numer. Anal.* 40, 2020, pp. 563-586

[7] **Tianxiang Liu**, Ting Kei Pong and Akiko Takeda. A successive difference-of-convex approximation method for a class of nonconvex nonsmooth optimization problems. *Math. Program.* 176, 2019, pp. 339-367.

[8] Guoyin Li, **Tianxiang Liu** and Ting Kei Pong. Peaceman-Rachford splitting for a class of nonconvex optimization problems. *Comput. Optim. & Appl.* 68, 2017, pp. 407-436.

[9] **Tianxiang Liu** and Ting Kei Pong. Further properties of the forward-backward envelope with applications to difference-of-convex programming. *Comput. Optim. & Appl.* 67, 2017, pp. 489-520.

Conference Talks

Sept. 2021 **日本 OR 学会 2021 年秋季研究発表会**, *DC* 問題に対する非厳密 *Newton* 型近接勾配法, Online.

Aug. 2021 **数理最適化の理論と応用の深化**, 穏当なエラーバウンド及び収束率, Online.

July. 2021 **OP21**, *Convergence analysis under consistent error bounds*, Online.

Mar. 2021 **最適化:モデリングとアルゴリズム**, *An inexact successive quadratic approximation method for a class of difference-of-convex optimization problems*, Online.

Mar. 2021 **日本 OR 学会 2021 年春季研究発表**, 穏当なエラーバウンドと収束解析, Online.

Aug. 2019 **NACA-ICOTA2019**, *A hybrid penalty method for a class of optimization problems with multiple rank constraints*, Hakodate.

Aug. 2019 **ICCOPT2019**, *A successive difference-of-convex approximation method with applications to control problems*, Berlin.

Jul. 2018 **EURO2018**, *A successive difference-of-convex approximation method for a class of nonconvex nonsmooth optimization problems*, Valencia.

Jul. 2018 **ISMP2018**, *A successive difference-of-convex approximation method for a class of nonconvex nonsmooth optimization problems*, Bordeaux.

May 2018 **SIAM-ALA18**, *An exact penalty method for semidefinite-box constrained low-rank matrix optimization problems*, Hong Kong.

May 2017 **SIOPT2017**, *Further properties of the forward-backward envelope with applications to difference-of-convex programming*, Vancouver.

Research Funding

Oct.2021–Mar.2024 **科学技術振興機構 (JST) の戦略的創造研究推進事業「ACT-X」**.
研究課題名：「構造化制約付き最適化問題の効率的な解法の開発と機械学習への応用」

Teaching experience

2022 年 1Q **「数理最適化」演習**, 東京工業大学.

2021 年 1Q **「数理最適化」演習**, 東京工業大学.

Visiting Experience

Jun.2014–Jun.2015 **Research Assistant**, *Prof. Xiaojun Chen*, Hong Kong.
The Hong Kong Polytechnic University. Joint Supervision Scheme with the Chinese Mainland, Taiwan and Macao University.

Professional services

Mathematical Programming, SIAM Journal on Optimization, Mathematics of Operations Research, Computational Optimization and Applications, Journal of Global Optimization, Journal of the Operations Research Society of China.

Languages

English Professional working proficiency

Japanese Elementary

Mandarin Native

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