

IE 8990

Spring 2022

Homework #4

Due Date: 05/05/2022 5PM CST

Submission: Please put your answer and code in a PDF file and upload on Canvas

- Q1. Proof that any local solution of the convex problem is a global solution.
- Q2. Please discuss the convergence rate of ISTA and FISTA algorithms.
Hint: please check this paper. Beck, Amir, and Marc Teboulle. "A fast iterative shrinkage-thresholding algorithm for linear inverse problems." SIAM journal on imaging sciences 2, no. 1 (2009): 183-202.
- Q3. Bonus: Select **one** article from below and summarize it (1 page, single-space, font size 12pt)
- Choi, Dami, Christopher J. Shallue, Zachary Nado, Jaehoon Lee, Chris J. Maddison, and George E. Dahl. "On empirical comparisons of optimizers for deep learning." arXiv preprint arXiv:1910.05446 (2019).
 - Schmidt, Mark, Nicolas Roux, and Francis Bach. "Convergence rates of inexact proximal-gradient methods for convex optimization." Advances in neural information processing systems 24 (2011).