

May 16, 2020

Professor Richard Samworth
Professor Ming Yuan
Editors-in-Chief
Annals of Statistics

Dear Profs. Samworth and Yuan:

We would like to submit the manuscript “Model Repair: Robust Recovery of Over-Parameterized Statistical Models” for review and possible publication in the *Annals of Statistics*.

In this paper we introduce the problem of model repair, which is to recover a statistical model that has been corrupted after estimation. We relate model repair to robust estimation, and establish a series of results showing the theoretical performance of a repair algorithm that is based on median regression. The specific models treated include linear models and families of neural networks trained using gradient descent. Experimental results validate the theory, quantifying how model repair requires over-parameterization in the model and redundancy in the estimator.

The manuscript is 22 pages including references, with seven figures. A supplement includes proofs of the technical results that are not proved in the main text. All of the results in this manuscript are new and have not been previously published or submitted.

We appreciate your consideration and evaluation of this work for possible publication, and look forward to your reply.

Sincerely,

Chao Gao
John Lafferty