

1 We really appreciate the time and expertise you have invested in these reviews. We wish to express our appreciation for
2 your in-depth comments, suggestions, and corrections, which will greatly improve the manuscript. Please see below for
3 our responses to individual questions and comments.

4 **Reviewer #1**

5 We thank for your positive feedback.

6 **Reviewer #4**

7 *The limitation of proving the equivalence in regression:* The major hurdle that we explained in the paper is specific to
8 existing proof techniques. That is to say, there is no obvious way to extend the current proof in the classification setting
9 to the regression setting. It is still possible that there is another method to prove the result for regression. To the best of
10 our knowledge, there is neither positive nor negative evidence whether online regression learnability implies private
11 regression learnability. We will make it clearer in the final version that the limitation stems from currently known proof
12 techniques.

13 **Reviewer #5**

14 *Presentation of Algorithm 2:* We will make Algorithm 2 more formal and make the proof of Theorem 8 more readable.

15 *Reduction from regression to classification:* There are papers that use regression models in multi-class classification
16 (e.g., see Rakesh, K., & Suganthan, P. N. (2017). An ensemble of kernel ridge regression for multi-class classification.
17 or Yang, Z., Deng, N., & Tian, Y. (2005). A multi-class classification algorithm based on ordinal regression machine.)
18 However, we are not aware of any previous work that studies regression learnability by transforming the problem into a
19 discretized classification problem. Furthermore, our work is the first one that proposes the Littlestone dimension with
20 tolerance, which is the main key to bridge regression and classification learnability. We will clarify these points in the
21 final version.

22 **Reviewer #6**

23 *Bandit or full information feedback:* We considered the full information setting in that the learner receives the true label
24 information after making a prediction. Thanks for raising this issue, and we will update Section 2.3 to clarify that the
25 learner gets full information feedback.

26 *Realizable or agnostic setting:* For the sake of clear presentation, we only discussed the realizable setting in the paper.
27 Alon et al. (2019) only consider the realizable setting while Bun et al. (2020) discuss the extension to the agnostic
28 setting. In fact, at least for the direction that online learnability implies private learnability, it is not hard to extend the
29 argument to the agnostic setting. For example, in the manuscript, "Closure Properties for Private Classification and
30 Online Prediction," Alon et al. (2020) show that private learning implies private agnostic learning (see their Theorem
31 2.4). We will make this clearer in the main text, and introduce the aforementioned theorem in the appendix to make the
32 story complete.

33 *Additional comments:* Thanks for your suggestions for improving presentation. We will address them in the final
34 version.