

## Checklist

1. For all models and algorithms presented, check if you include:
  - (a) A clear description of the mathematical setting, assumptions, algorithm, and/or model. Yes
  - (b) An analysis of the properties and complexity (time, space, sample size) of any algorithm. Yes
  - (c) (Optional) Anonymized source code, with specification of all dependencies, including external libraries. No
2. For any theoretical claim, check if you include:
  - (a) Statements of the full set of assumptions of all theoretical results. Yes
  - (b) Complete proofs of all theoretical results. Yes
  - (c) Clear explanations of any assumptions. Yes
3. For all figures and tables that present empirical results, check if you include:
  - (a) The code, data, and instructions needed to reproduce the main experimental results (either in the supplemental material or as a URL). Yes
  - (b) All the training details (e.g., data splits, hyperparameters, how they were chosen). Yes
  - (c) A clear definition of the specific measure or statistics and error bars (e.g., with respect to the random seed after running experiments multiple times). Yes
  - (d) A description of the computing infrastructure used. (e.g., type of GPUs, internal cluster, or cloud provider). Yes
4. If you are using existing assets (e.g., code, data, models) or curating/releasing new assets, check if you include:
  - (a) Citations of the creator If your work uses existing assets. Yes
  - (b) The license information of the assets, if applicable. Yes
  - (c) New assets either in the supplemental material or as a URL, if applicable. Yes
  - (d) Information about consent from data providers/curators. Not applicable
  - (e) Discussion of sensible content if applicable, e.g., personally identifiable information or offensive content. Not Applicable
5. If you used crowdsourcing or conducted research with human subjects, check if you include:

- (a) The full text of instructions given to participants and screenshots. Not Applicable
- (b) Descriptions of potential participant risks, with links to Institutional Review Board (IRB) approvals if applicable. Not Applicable
- (c) The estimated hourly wage paid to participants and the total amount spent on participant compensation. Not Applicable