

632 **NeurIPS Paper Checklist**

633 **1. Claims**

634 Question: Do the main claims made in the abstract and introduction accurately reflect the
635 paper's contributions and scope?

636 Answer: [Yes]

637 Justification: Yes, we have ensured that the main claims in the abstract and introduction
638 accurately reflect the paper's contributions and scope.

639 Guidelines:

- 640 • The answer NA means that the abstract and introduction do not include the claims
641 made in the paper.
- 642 • The abstract and/or introduction should clearly state the claims made, including the
643 contributions made in the paper and important assumptions and limitations. A No or
644 NA answer to this question will not be perceived well by the reviewers.
- 645 • The claims made should match theoretical and experimental results, and reflect how
646 much the results can be expected to generalize to other settings.
- 647 • It is fine to include aspirational goals as motivation as long as it is clear that these goals
648 are not attained by the paper.

649 **2. Limitations**

650 Question: Does the paper discuss the limitations of the work performed by the authors?

651 Answer: [Yes] .

652 Justification: Yes, we have discussed the limitations and future work in Appendix **A**

653 Guidelines:

- 654 • The answer NA means that the paper has no limitation while the answer No means that
655 the paper has limitations, but those are not discussed in the paper.
- 656 • The authors are encouraged to create a separate "Limitations" section in their paper.
- 657 • The paper should point out any strong assumptions and how robust the results are to
658 violations of these assumptions (e.g., independence assumptions, noiseless settings,
659 model well-specification, asymptotic approximations only holding locally). The authors
660 should reflect on how these assumptions might be violated in practice and what the
661 implications would be.
- 662 • The authors should reflect on the scope of the claims made, e.g., if the approach was
663 only tested on a few datasets or with a few runs. In general, empirical results often
664 depend on implicit assumptions, which should be articulated.
- 665 • The authors should reflect on the factors that influence the performance of the approach.
666 For example, a facial recognition algorithm may perform poorly when image resolution
667 is low or images are taken in low lighting. Or a speech-to-text system might not be
668 used reliably to provide closed captions for online lectures because it fails to handle
669 technical jargon.
- 670 • The authors should discuss the computational efficiency of the proposed algorithms
671 and how they scale with dataset size.
- 672 • If applicable, the authors should discuss possible limitations of their approach to
673 address problems of privacy and fairness.
- 674 • While the authors might fear that complete honesty about limitations might be used by
675 reviewers as grounds for rejection, a worse outcome might be that reviewers discover
676 limitations that aren't acknowledged in the paper. The authors should use their best
677 judgment and recognize that individual actions in favor of transparency play an impor-
678 tant role in developing norms that preserve the integrity of the community. Reviewers
679 will be specifically instructed to not penalize honesty concerning limitations.

680 **3. Theory Assumptions and Proofs**

681 Question: For each theoretical result, does the paper provide the full set of assumptions and
682 a complete (and correct) proof?

683 Answer: [NA] .

684 Justification: There is no theoretical result in this paper that requires a full set of assumptions
685 and correct proof.

686 Guidelines:

- 687 • The answer NA means that the paper does not include theoretical results.
- 688 • All the theorems, formulas, and proofs in the paper should be numbered and cross-
689 referenced.
- 690 • All assumptions should be clearly stated or referenced in the statement of any theorems.
- 691 • The proofs can either appear in the main paper or the supplemental material, but if
692 they appear in the supplemental material, the authors are encouraged to provide a short
693 proof sketch to provide intuition.
- 694 • Inversely, any informal proof provided in the core of the paper should be complemented
695 by formal proofs provided in appendix or supplemental material.
- 696 • Theorems and Lemmas that the proof relies upon should be properly referenced.

697 4. Experimental Result Reproducibility

698 Question: Does the paper fully disclose all the information needed to reproduce the main ex-
699 perimental results of the paper to the extent that it affects the main claims and/or conclusions
700 of the paper (regardless of whether the code and data are provided or not)?

701 Answer: [Yes]

702 Justification: Yes, we have fully disclosed the information needed to reproduce the main
703 experimental results of the paper. They are written in Section [5](#) and Appendix [D](#).

704 Guidelines:

- 705 • The answer NA means that the paper does not include experiments.
- 706 • If the paper includes experiments, a No answer to this question will not be perceived
707 well by the reviewers: Making the paper reproducible is important, regardless of
708 whether the code and data are provided or not.
- 709 • If the contribution is a dataset and/or model, the authors should describe the steps taken
710 to make their results reproducible or verifiable.
- 711 • Depending on the contribution, reproducibility can be accomplished in various ways.
712 For example, if the contribution is a novel architecture, describing the architecture fully
713 might suffice, or if the contribution is a specific model and empirical evaluation, it may
714 be necessary to either make it possible for others to replicate the model with the same
715 dataset, or provide access to the model. In general, releasing code and data is often
716 one good way to accomplish this, but reproducibility can also be provided via detailed
717 instructions for how to replicate the results, access to a hosted model (e.g., in the case
718 of a large language model), releasing of a model checkpoint, or other means that are
719 appropriate to the research performed.
- 720 • While NeurIPS does not require releasing code, the conference does require all submis-
721 sions to provide some reasonable avenue for reproducibility, which may depend on the
722 nature of the contribution. For example
 - 723 (a) If the contribution is primarily a new algorithm, the paper should make it clear how
724 to reproduce that algorithm.
 - 725 (b) If the contribution is primarily a new model architecture, the paper should describe
726 the architecture clearly and fully.
 - 727 (c) If the contribution is a new model (e.g., a large language model), then there should
728 either be a way to access this model for reproducing the results or a way to reproduce
729 the model (e.g., with an open-source dataset or instructions for how to construct
730 the dataset).
 - 731 (d) We recognize that reproducibility may be tricky in some cases, in which case
732 authors are welcome to describe the particular way they provide for reproducibility.
733 In the case of closed-source models, it may be that access to the model is limited in
734 some way (e.g., to registered users), but it should be possible for other researchers
735 to have some path to reproducing or verifying the results.

736 5. Open access to data and code

737 Question: Does the paper provide open access to the data and code, with sufficient instruc-
738 tions to faithfully reproduce the main experimental results, as described in supplemental
739 material?

740 Answer: [Yes] .

741 Justification: Yes, we are submitting the code for HYDRA-FL in the supplementary material.
742 For now, we have given the code where HYDRA-FL is adapted to FedNTD. We provide an
743 "instructions.txt" file to reproduce our results. We will publish our full code for FedNTD and
744 MOON on github with the final version of this paper.

745 Guidelines:

- 746 • The answer NA means that paper does not include experiments requiring code.
- 747 • Please see the NeurIPS code and data submission guidelines ([https://nips.cc/
748 public/guides/CodeSubmissionPolicy](https://nips.cc/public/guides/CodeSubmissionPolicy)) for more details.
- 749 • While we encourage the release of code and data, we understand that this might not be
750 possible, so "No" is an acceptable answer. Papers cannot be rejected simply for not
751 including code, unless this is central to the contribution (e.g., for a new open-source
752 benchmark).
- 753 • The instructions should contain the exact command and environment needed to run to
754 reproduce the results. See the NeurIPS code and data submission guidelines ([https:
755 //nips.cc/public/guides/CodeSubmissionPolicy](https://nips.cc/public/guides/CodeSubmissionPolicy)) for more details.
- 756 • The authors should provide instructions on data access and preparation, including how
757 to access the raw data, preprocessed data, intermediate data, and generated data, etc.
- 758 • The authors should provide scripts to reproduce all experimental results for the new
759 proposed method and baselines. If only a subset of experiments are reproducible, they
760 should state which ones are omitted from the script and why.
- 761 • At submission time, to preserve anonymity, the authors should release anonymized
762 versions (if applicable).
- 763 • Providing as much information as possible in supplemental material (appended to the
764 paper) is recommended, but including URLs to data and code is permitted.

765 6. Experimental Setting/Details

766 Question: Does the paper specify all the training and test details (e.g., data splits, hyper-
767 parameters, how they were chosen, type of optimizer, etc.) necessary to understand the
768 results?

769 Answer: [Yes] .

770 Justification: We specify the training and test details in Appendix [D](#).

771 Guidelines:

- 772 • The answer NA means that the paper does not include experiments.
- 773 • The experimental setting should be presented in the core of the paper to a level of detail
774 that is necessary to appreciate the results and make sense of them.
- 775 • The full details can be provided either with the code, in appendix, or as supplemental
776 material.

777 7. Experiment Statistical Significance

778 Question: Does the paper report error bars suitably and correctly defined or other appropriate
779 information about the statistical significance of the experiments?

780 Answer: [No] .

781 Justification: We did not have enough compute resources to completely re-run all the
782 experiments for different seeds and report error bars for different runs. We are currently re-
783 running the error bar experiments, and we plan to include all the experiments with different
784 seeds in the final version.

785 Guidelines:

- 786 • The answer NA means that the paper does not include experiments.
- 787 • The authors should answer "Yes" if the results are accompanied by error bars, confi-
788 dence intervals, or statistical significance tests, at least for the experiments that support
789 the main claims of the paper.

- 790 • The factors of variability that the error bars are capturing should be clearly stated (for
791 example, train/test split, initialization, random drawing of some parameter, or overall
792 run with given experimental conditions).
- 793 • The method for calculating the error bars should be explained (closed form formula,
794 call to a library function, bootstrap, etc.)
- 795 • The assumptions made should be given (e.g., Normally distributed errors).
- 796 • It should be clear whether the error bar is the standard deviation or the standard error
797 of the mean.
- 798 • It is OK to report 1-sigma error bars, but one should state it. The authors should
799 preferably report a 2-sigma error bar than state that they have a 96% CI, if the hypothesis
800 of Normality of errors is not verified.
- 801 • For asymmetric distributions, the authors should be careful not to show in tables or
802 figures symmetric error bars that would yield results that are out of range (e.g. negative
803 error rates).
- 804 • If error bars are reported in tables or plots, The authors should explain in the text how
805 they were calculated and reference the corresponding figures or tables in the text.

8. Experiments Compute Resources

807 Question: For each experiment, does the paper provide sufficient information on the com-
808 puter resources (type of compute workers, memory, time of execution) needed to reproduce
809 the experiments?

810 Answer: [Yes] .

811 Justification: We present these details in Appendix [D](#).

812 Guidelines:

- 813 • The answer NA means that the paper does not include experiments.
- 814 • The paper should indicate the type of compute workers CPU or GPU, internal cluster,
815 or cloud provider, including relevant memory and storage.
- 816 • The paper should provide the amount of compute required for each of the individual
817 experimental runs as well as estimate the total compute.
- 818 • The paper should disclose whether the full research project required more compute
819 than the experiments reported in the paper (e.g., preliminary or failed experiments that
820 didn't make it into the paper).

9. Code Of Ethics

822 Question: Does the research conducted in the paper conform, in every respect, with the
823 NeurIPS Code of Ethics <https://neurips.cc/public/EthicsGuidelines?>

824 Answer: [Yes] .

825 Justification: Yes, to the best of our knowledge, our paper conforms to the NeurIPS Code of
826 Ethics in every aspect.

827 Guidelines:

- 828 • The answer NA means that the authors have not reviewed the NeurIPS Code of Ethics.
- 829 • If the authors answer No, they should explain the special circumstances that require a
830 deviation from the Code of Ethics.
- 831 • The authors should make sure to preserve anonymity (e.g., if there is a special consid-
832 eration due to laws or regulations in their jurisdiction).

10. Broader Impacts

834 Question: Does the paper discuss both potential positive societal impacts and negative
835 societal impacts of the work performed?

836 Answer: [NA] .

837 Justification: Or work does not have such a societal impact that requires discussion in the
838 paper.

839 Guidelines:

- 840 • The answer NA means that there is no societal impact of the work performed.

- 841
- 842
- 843
- 844
- 845
- 846
- 847
- 848
- 849
- 850
- 851
- 852
- 853
- 854
- 855
- 856
- 857
- 858
- 859
- 860
- 861
- If the authors answer NA or No, they should explain why their work has no societal impact or why the paper does not address societal impact.
 - Examples of negative societal impacts include potential malicious or unintended uses (e.g., disinformation, generating fake profiles, surveillance), fairness considerations (e.g., deployment of technologies that could make decisions that unfairly impact specific groups), privacy considerations, and security considerations.
 - The conference expects that many papers will be foundational research and not tied to particular applications, let alone deployments. However, if there is a direct path to any negative applications, the authors should point it out. For example, it is legitimate to point out that an improvement in the quality of generative models could be used to generate deepfakes for disinformation. On the other hand, it is not needed to point out that a generic algorithm for optimizing neural networks could enable people to train models that generate Deepfakes faster.
 - The authors should consider possible harms that could arise when the technology is being used as intended and functioning correctly, harms that could arise when the technology is being used as intended but gives incorrect results, and harms following from (intentional or unintentional) misuse of the technology.
 - If there are negative societal impacts, the authors could also discuss possible mitigation strategies (e.g., gated release of models, providing defenses in addition to attacks, mechanisms for monitoring misuse, mechanisms to monitor how a system learns from feedback over time, improving the efficiency and accessibility of ML).

862 **11. Safeguards**

863 Question: Does the paper describe safeguards that have been put in place for responsible
864 release of data or models that have a high risk for misuse (e.g., pretrained language models,
865 image generators, or scraped datasets)?

866 Answer: [NA] .

867 Justification: To the best of our knowledge, our paper poses no such risks. We use publicly
868 available code and data for our work.

869 Guidelines:

- 870
- 871
- 872
- 873
- 874
- 875
- 876
- 877
- 878
- 879
- The answer NA means that the paper poses no such risks.
 - Released models that have a high risk for misuse or dual-use should be released with necessary safeguards to allow for controlled use of the model, for example by requiring that users adhere to usage guidelines or restrictions to access the model or implementing safety filters.
 - Datasets that have been scraped from the Internet could pose safety risks. The authors should describe how they avoided releasing unsafe images.
 - We recognize that providing effective safeguards is challenging, and many papers do not require this, but we encourage authors to take this into account and make a best faith effort.

880 **12. Licenses for existing assets**

881 Question: Are the creators or original owners of assets (e.g., code, data, models), used in
882 the paper, properly credited and are the license and terms of use explicitly mentioned and
883 properly respected?

884 Answer: [Yes] .

885 Justification: We have cited all three datasets; MNIST [19], CIFAR10 [17], and CI-
886 FAR100 [17]. Their licenses are not mentioned on paperswithcode.

887 Guidelines:

- 888
- 889
- 890
- 891
- 892
- The answer NA means that the paper does not use existing assets.
 - The authors should cite the original paper that produced the code package or dataset.
 - The authors should state which version of the asset is used and, if possible, include a URL.
 - The name of the license (e.g., CC-BY 4.0) should be included for each asset.

- 893
- For scraped data from a particular source (e.g., website), the copyright and terms of service of that source should be provided.
 - 894
 - 895
 - 896
 - 897
 - 898
 - If assets are released, the license, copyright information, and terms of use in the package should be provided. For popular datasets, paperswithcode.com/datasets has curated licenses for some datasets. Their licensing guide can help determine the license of a dataset.
 - 899
 - For existing datasets that are re-packaged, both the original license and the license of the derived asset (if it has changed) should be provided.
 - 900
 - If this information is not available online, the authors are encouraged to reach out to the asset's creators.
 - 901
 - 902

903 13. New Assets

904 Question: Are new assets introduced in the paper well documented and is the documentation provided alongside the assets?

905 Answer: [Yes] .

906 Justification: Yes, we are submitting the code for HYDRA-FL in the supplementary material. For now, we have given the code where HYDRA-FL is adapted to FedNTD. We provide an "instructions.txt" file to reproduce our results.

907 Guidelines:

- 908
- 909
- 910
- 911
- 912
- 913
- 914
- 915
- 916
- 917
- 918
- The answer NA means that the paper does not release new assets.
- Researchers should communicate the details of the dataset/code/model as part of their submissions via structured templates. This includes details about training, license, limitations, etc.
- The paper should discuss whether and how consent was obtained from people whose asset is used.
- At submission time, remember to anonymize your assets (if applicable). You can either create an anonymized URL or include an anonymized zip file.

919 14. Crowdsourcing and Research with Human Subjects

920 Question: For crowdsourcing experiments and research with human subjects, does the paper include the full text of instructions given to participants and screenshots, if applicable, as well as details about compensation (if any)?

921 Answer: [NA] .

922 Justification: Our paper does not involve any crowdsourcing experiments nor research with human subjects.

923 Guidelines:

- 924
- 925
- 926
- 927
- 928
- 929
- 930
- 931
- 932
- 933
- 934
- The answer NA means that the paper does not involve crowdsourcing nor research with human subjects.
- Including this information in the supplemental material is fine, but if the main contribution of the paper involves human subjects, then as much detail as possible should be included in the main paper.
- According to the NeurIPS Code of Ethics, workers involved in data collection, curation, or other labor should be paid at least the minimum wage in the country of the data collector.

935 15. Institutional Review Board (IRB) Approvals or Equivalent for Research with Human Subjects

936 Question: Does the paper describe potential risks incurred by study participants, whether such risks were disclosed to the subjects, and whether Institutional Review Board (IRB) approvals (or an equivalent approval/review based on the requirements of your country or institution) were obtained?

937 Answer: [NA] .

938 Justification: Our paper does not involve crowdsourcing nor research with human subjects.

939 Guidelines:

944
945
946
947
948
949
950
951
952
953

- The answer NA means that the paper does not involve crowdsourcing nor research with human subjects.
- Depending on the country in which research is conducted, IRB approval (or equivalent) may be required for any human subjects research. If you obtained IRB approval, you should clearly state this in the paper.
- We recognize that the procedures for this may vary significantly between institutions and locations, and we expect authors to adhere to the NeurIPS Code of Ethics and the guidelines for their institution.
- For initial submissions, do not include any information that would break anonymity (if applicable), such as the institution conducting the review.