Dear Editors and Reviewers:  
  
We would like to submit the enclosed manuscript entitled "AdaCompress: Adaptive Reinforcement Learning based Compression for Online Computer Vision Services," which we wish to be considered for publication in IEEE Transactions on Multimedia. No conflict of interest exists in the submission of this manuscript, and the manuscript is approved by all authors for publication.   
  
This paper is an extension of our previous publication in Proceedings of ACM Multimedia 2019 (<https://arxiv.org/pdf/1909.08148.pdf>). We have significantly improved the conference version (9 pages) into this journal version (13 pages), with the following major extensions.  
  
1. We have significantly improved the AdaCompress framework, to provide more generality and robustness of the whole design. First, to improve AdaCompress' efficiency upon re-train (e.g., upon the scenery changes), in this extension, we have introduced a new inference-estimation-querying-retraining mechanism to avoid unnecessary iteration during the re-train phase by letting the framework "re-use" a historical cached model (the new Figure 3 shows the updated AdaCompress architecture). Second, to incorporate the new mechanism into the original AdaCompress framework, we have re-designed the state switching policy, with a newly added state "model querying" (the new Figure 4 shows the updated state switching policy). More details are provided in Section 3.  
  
2. We have provided more solid motivation and evidence for our design. In particular, the new Figure 6 shows the different performance of the same backend model (e.g., Baidu Vision), under different input datasets (e.g., ImageNet and FLIR), as shown in the new Figure 12. These new insights provide more solid evidence for our design. More details are provided in the new Section 3.6.  
  
3. We have also significantly improved our evaluation of the design. We have implemented baseline DeepN-JPEG[1], and show that our design has much higher accuracy than DeepN-JPEG when they both compress the input images to the same level, as shown in the new Figure 10. More details are provided in the new Section 4.6.   
  
4. We have also improved the related works, to include more recent related studies in this area.   
  
Last but not least, we have also improved the presentation of the whole paper.   
  
We deeply appreciate your consideration of our manuscript, and we look forward to receiving comments from the reviewers.   
  
Thank you and best regards.  
  
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1. Zihao Liu, Tao Liu, Wujie Wen, Lei Jiang, & Gang Quan. (2018). DeepN-JPEG: a deep neural network favorable JPEG-based image compression framework. *the 55th Annual Design Automation Conference*.