

The 28th International Conference of Hong Kong Society for Transportation Studies

9-10 December 2024, Hong Kong

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Hong Kong Society for
Transportation Studies



Department of Civil and Environmental Engineering
and
Department of Industrial and Systems Engineering
The Hong Kong Polytechnic University

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














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Topics	Emerging and Future Mobility, Innovative Technology in Transportation
Abstract	As an important part of the mobile sensing system, the vehicle sensing system has great potential to collect large quantities of spatio-temporal sensing information with low operation costs by the pre-installed mobile sensors. Sensing systems usually need to sample data with different distributions to obtain sufficient information for different usages. The crucial problem is how to predict the vehicle positions and allocate vehicles to match targeted sensing distributions. A conventional method for the problem is a 2-stage predict-then-optimize method. However, training the prediction model based on prediction error can lead to inferior decision-making compared with directly minimizing the decision error. To this end, we propose an end-to-end smart predict-then-optimize (SPO) method by integrating optimization into prediction within the deep learning architecture. We also develop an alternating differentiation method to compute the gradients of the optimization layer. This SPO framework uses the task-specific loss function of the eventual effective decision rather than the function of prediction loss. We evaluate the effectiveness and robustness of the proposed framework by conducting various experiments using real taxi datasets in Hong Kong with different scale networks and targeted distributions.
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If there is any enquiry, please contact:
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