

Engineers join forces for eco-efficient online shopping

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Home-delivery services perpetually compete for the consumer's attention not only through advertisements but also through methods that reduce basket decision time or make new suggestions. Current research on the topic focuses on optimizing delivery schedules and minimizing costs.

However, neither the insufficiency of home delivery options for some cities nor the bigger problem of high carbon emissions due to the abundance of it, are resolved.

A new study conducted by Koç University Industrial Engineering Department professor Barış Yıldız published in *Computers & Operations Research* takes a fresh perspective to optimize this process. The [project](#) presents an eco-friendlier operation and capitalizes otherwise idle time and vehicle capacities.

The project proposes the use of push notifications for [potential customers](#) who reside in easily incorporable locations within delivery routes. Through these opportunity sales, the study presents a process that can generate extra profit for retailers and ease the process for customers by favoring time and [energy efficiency](#).

Highly effective policies and mathematical models are required to tackle the uncertainties during the adjustment of customer selection and vehicle routing decisions. Dr. Barış Yıldız and his colleagues introduce an innovative integer linear programming [model](#) to solve the challenges. Through extensive computational experiments, they have demonstrated the applicability and profitability of the new business model. Equipped with dynamic decision making, their proposal competes with the risk-ignorant models in terms of total profitability.

As the new normal in retail, [online shopping](#) is not going anywhere. But imagine your weekly/monthly needs to be sequenced with your neighbors and your regular requirements to be met by a smart vehicle letting you know it's about to stop by with more diapers or can return your last purchase. The study proves there is potential worth the effort.

It introduces the idea of retailers making opportunity sales not at the expense of the environment but in line with its needs. Dr. Barış Yıldız

and his colleagues make sure this can happen effectively. Also, rethinking delivery operations as a profit-making activity rather than a cost-minimizing one, constitutes a major contribution for [retailers](#). The new model and its open algorithm await their first innovative businesses.

More information: Çelen Naz Ötken et al, Making opportunity sales in attended home delivery, *Computers & Operations Research* (2023).

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