

Optimally Delisting Products That Are Likely To Arrive Damaged

Nathaniel Burbank & Tim Scully, Informs 2021 Annual Meeting, Anaheim Convention Center, Anaheim, CA

Orders that arrive damaged can create unhappy customers and increase Wayfair's shipping costs. Identifying which products are likely to break during shipment, however, is challenging because of the difficulty in distinguishing between differences in latent damage rates and sampling variation, especially in the long tail of our large catalog. To compensate, we apply a combination of probabilistic modeling and gradient boosted trees to predict future damage rates. We combine these predictions with cost and customer experience assumptions to decide which products to delist (if any), while balancing the benefits of diverse selection with the negative outcomes of damages.