

Seminar AGCO

Speaker: Sebastián Perez, Georgia Tech, USA.

Title: Adaptive bin packing with overflow.

Abstract: Motivated by the allocation of virtual machines into servers in the cloud, we consider the online problem of packing items with random sizes into unit-capacity bins. Items arrive sequentially, but upon arrival an item's actual size is unknown; only its probabilistic information is available to the decision maker. Without knowing this size, the decision maker must irrevocably pack the item into an available bin or place it in a new bin. Once packed in a bin, the decision maker observes the item's actual size, and overflowing the bin is a possibility. An overflow incurs a large penalty cost and the corresponding bin is unusable for the rest of the process. In practical terms, this overflow models delayed services, failure of servers, and/or loss of end-user goodwill. The objective is to minimize the total expected cost given by the sum of the number of opened bins and the overflow penalty cost. In this talk, we present an online algorithm with expected cost at most a constant factor times the cost incurred by the optimal packing policy when item sizes are drawn from an i.i.d. sequence. We discuss the limits of our approach and extensions to offline settings, where distributions are known in advance but packed sequentially. Joint work with Mohit Singh and Alejandro Toriello.

Wednesday, March 24, **14:30 hrs (Chilean time)**.

Link: <https://zoom.us/j/94275197125?pwd=NmJueWxkYXhMNWtoeXZMSTVRNXJoUT09>