**Title:**

Assembling Orders in Amazon's Robotic Warehouses

**Abstract:**

Every day, Amazon picks, packs, and ships millions of customer orders from a network of fulfillment centers (FCs) spread all over the globe. With each FC holding millions of inventory items, most customer orders requiring a unique combination of several of these items, and many orders needing to be shipped within a few hours of being placed, cutting-edge advances in technology are needed to ensure that orders are fulfilled efficiently and shipped on time. In this talk, we will present Amazon's mobile robotic fulfillment solution, consisting of a fleet of thousands of drive units per FC that deliver inventory shelves to picking associates. We will describe the solution's key advantages and its main components, and provide an overview of the complex resource allocation and planning problems addressed by its sophisticated algorithms. We will also discuss the Amazon Robotics Challenge for advancing the state of the art in item manipulation and grasping, as well as a couple of big open problems in robotic warehousing.

**Bio:**

Fernando Tubilla is a senior research scientist at the Research and Advanced Development Team at Amazon Robotics (AR). He was part of the Kiva Systems team prior to the company’s acquisition and growth into AR, and has worked on the development and implementation of several of the key resource allocation and optimization algorithms driving AR's mobile fulfillment solution, encompassing areas such as inventory storage, work allocation, and flow control. Fernando holds a Ph.D. from MIT in dynamic scheduling and manufacturing operations research. His interests span the areas of control and optimization of logistics systems, as well as the application of automation and wireless sensor technologies to these areas. During his graduate studies, he received a fellowship from the Legatum Center for Development & Entrepreneurship.

