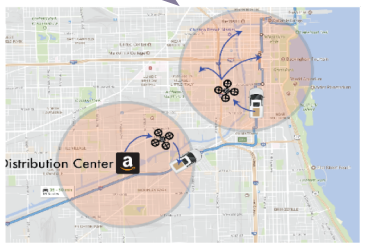
SYNDROME: SYNergetic DROne Delivery Network in MEtropolis

Naira Hovakimyan[†] , Lavanya Marla[†] , Marco Pavone[‡] , Srinvasa Salapaka[†] , Ranxiao Wang[†] , and Xiaofeng Wang[§]
[†]University of Illinois at Urbana-Champaign, [‡]Stanford University, [§]University of South Carolina

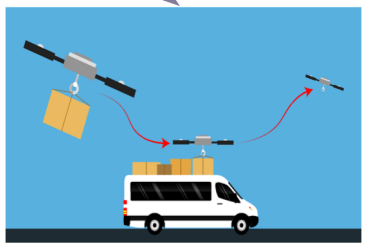
Motivation

The rapid growth of e-commerce demands has resulted in increased traffic of delivery trucks while **slowing down the pace** of delivery operations

Dispatch a package over the delivery network



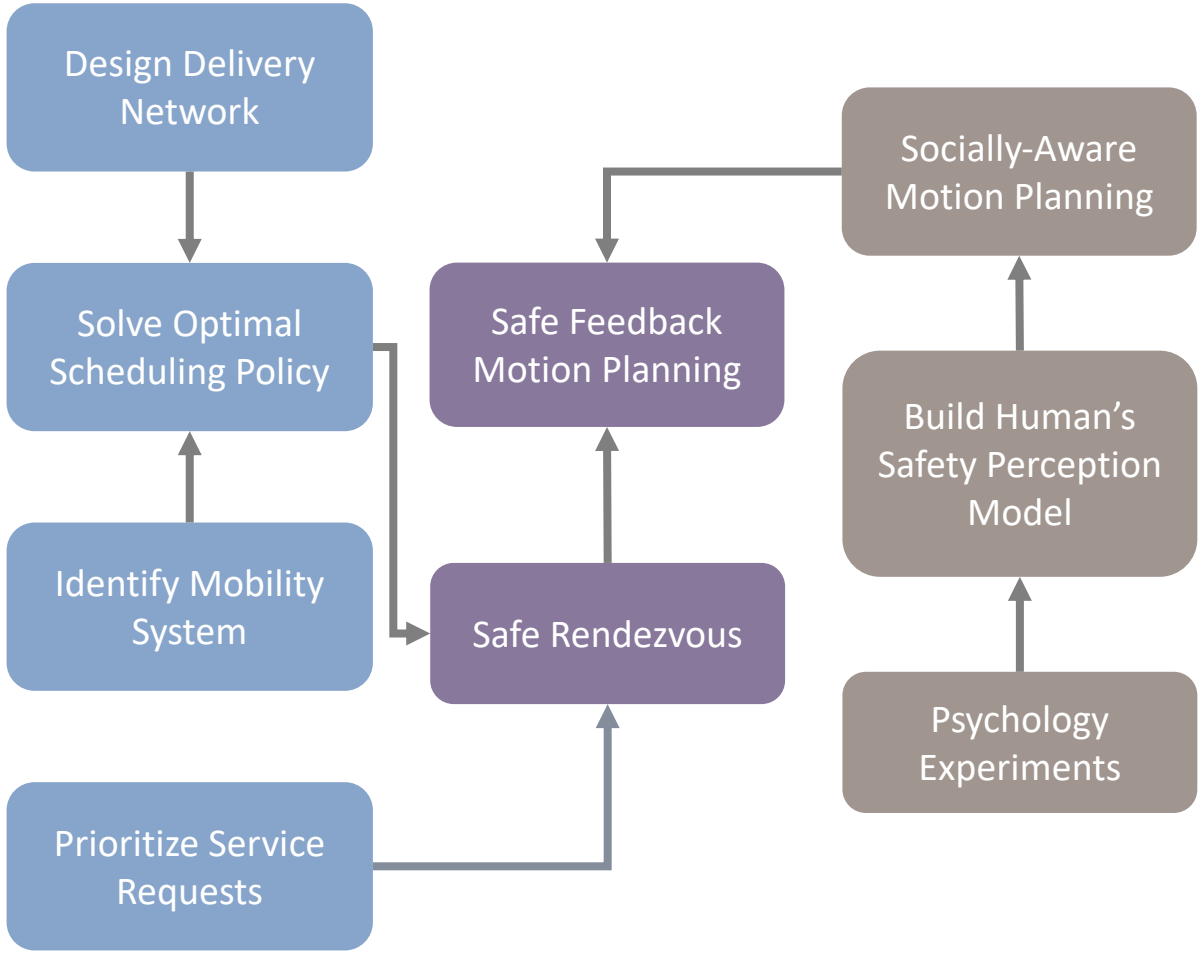
Use space on a ground vehicle's roof



Fly last-mile to the target position

The proposed delivery network is comprised of **autonomous flying robots** and **existing transport networks** (public and private ground vehicles).

Technical Approach



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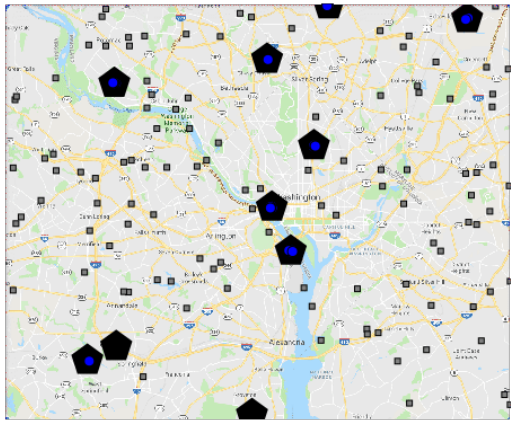
Large-Scale Drone Delivery Network



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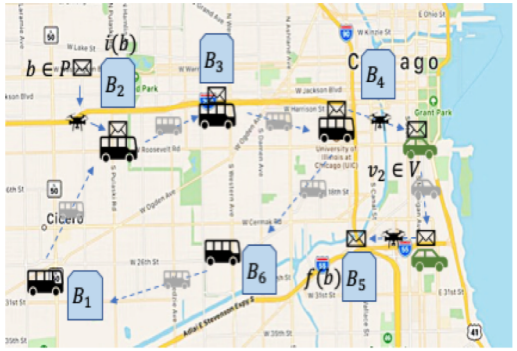
Dynamic Commodity Flow



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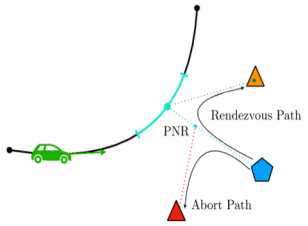
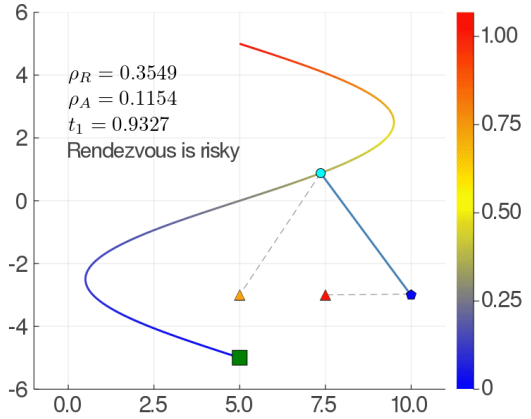
Risk Sensitive Rendezvous





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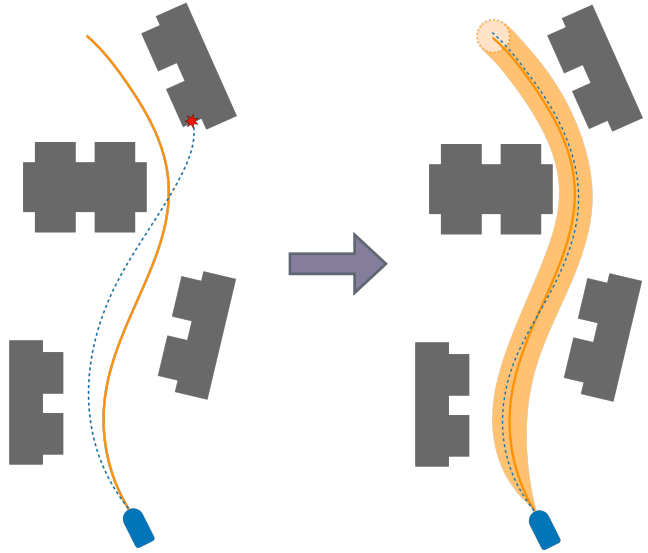
Socially-Aware Motion Planning

H. J. Yoon, P. Zhao, C. Tao, C. Widdowson, R. F. Wang, N. Hovakimyan, and E. Theodorou, "Socially Aware Motion Planning for a Flying Robot with Model Predictive Path Integral Control," ICRA 2019 Workshop.

Safe Feedback Motion Planning



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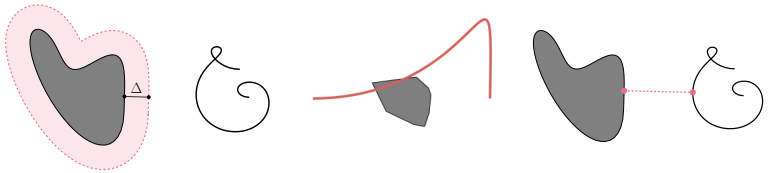
Fast Collision Detection



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