Long Title of the Presentation with Line Breaks

First & Last-Name

School of Aeronautics & Astronautics
Purdue University

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Outline

Introduction

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Scope

- Develop ...
- Prove ...
- Apply ...

Specific Contributions

- First achievement
- Second achievement
- Third achievement

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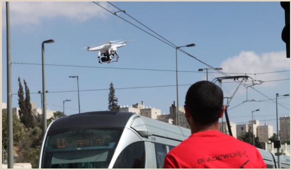
Motivation

Google drone delivery[1]

Amazon drone delivery[2]

Bladeworx's light-rail surveillance[3]



BP pipeline inspection[4]

1) www.thetimes.co.uk/tto/business/industries/technology/article4190571.ece
2) articles.latimes.com/2013/dec/03/business/la-fi-tn-amazon-ups-google-delivery-drones-20131203
3) www.smartrailworld.com/how_drones_are_already-being-used-by-railways-around-the-world
4) townhall.com/news/us/2013/06/07/in-alaskas-oilfields-drones-countdown-to-takeoff-n1615231

Preliminary Theory & Notation

Consider the uncertain nonlinear system described by

$$\dot{x} = \boldsymbol{\varphi}(x)^T \boldsymbol{\theta} + \Delta(x,t) + u$$

where,

$$\begin{aligned} x &: \text{ the state (scalar)} \\ \boldsymbol{\varphi}(x) &: \text{ vector of known basis functions} \\ \boldsymbol{\theta} &: \text{ vector of uncertain parameters} \\ \Delta(x,t) &: \text{ disturbances \& unmodeled dynamics} \\ u &: \text{ control input} \end{aligned}$$

For example, if $\dot{x} = a \sin x + d(x,t) + u$, then

$$\boldsymbol{\varphi} = \sin x\,, \quad \boldsymbol{\theta} = a\,, \quad \Delta(x,t) = d(x,t)$$

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Conclusion

Journal Papers:

- Submitted journal paper number 1
- Submitted journal paper number 2

Appendix: Supporting Materials

Projection-based Adaptation

The discontinuous projection is defined as follows.

$$\text{Proj}_{\hat{\theta}_i}(\bullet_i) := \begin{cases} 0 & \text{if } \begin{cases} \hat{\theta}_i = \hat{\theta}_{i,max} & \text{and} \quad \bullet_i > 0 \\ \hat{\theta}_i = \hat{\theta}_{i,min} & \text{and} \quad \bullet_i < 0 \end{cases} \\ \bullet_i & \text{otherwise} \end{cases}$$

This guarantees that $\hat{\boldsymbol{\theta}}(t) \in \Omega_\theta$ for all t, and therefore $\tilde{\boldsymbol{\theta}}(t)$ is bounded.