Stealthy Attacker Complexity in Cyber-Physical Systems: Milestone 3

https://c-er.github.io/15400/

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Major Changes: There have been no significant changes to the goals of the project so far.

What I Have Accomplished So Far: Thus far, I've completed my initial background knowledge acquisition, which included the first three chapters of this book[1] as well as two papers[2;3]. I have continued by brainstorming some potential measures of stealthy attacker complexity. Some measures seem to be addressed by the framework from the original paper[2], but others seem to require some additional machinery. Currently, I am focused on formally defining the simpler notions of complexity and proving that they are handled by the framework from the original paper.

Meeting My Milestone: I think I am about one week behind my milestones right now. With the reversal of the first few milestones, I should have proofs for the simpler notions of complexity right now, but I don't yet have them. I think this is mainly because I haven't been able to meet with my advisor lately.

Surprises: No big surprises so far.

Revisions to my 15-400 Milestones: As mentioned in the last report, my first few milestones are reversed, in the sense that I am brainstorming and working with potential measures of complexity before evaluating them on actual examples. I still have not received the software to work with examples from the authors of the stealthy attacker paper[2], so I may need to develop it myself. If that happens and it ends up taking a while, I may need to revise my milestones further.

Resources Needed: All the resources I need are freely available online, and will be easy to procure when I need them.

References

[1] CASSANDRAS, C. G., AND LAFORTUNE, S. *Introduction to Discrete Event Systems*, 2nd ed. Springer Publishing Company, Incorporated, 2010.

[2] GÓES, R. M., KANG, E., KWONG, R., AND LAFORTUNE, S. Stealthy deception attacks for cyber-physical systems. *2017 IEEE 56th Annual Conference on Decision and Control (CDC)* (2017), 4224–4230.

[3] YIN, X., AND LAFORTUNE, S. A uniform approach for synthesizing property-enforcing supervisors for partially-observed discrete-event systems. *IEEE Transactions on Automatic Control 61* (2016), 2140–2154.