Student experience with verification tools in the design competition

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- 1 student had attempted to build his own drone in the past and 2 students had some embedded systems experience.

- The online design competition is built on waypoint navigation for quadcopters.

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Verifying what?

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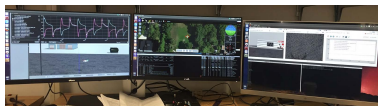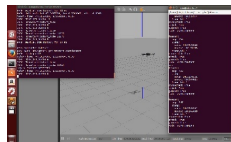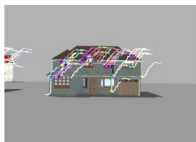

- Hence, we focused on verifying the controller rather than its implementation.

■ The controller was "verified" through extensively simulations.
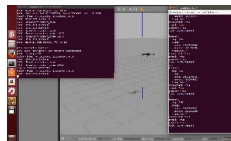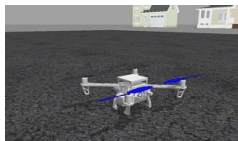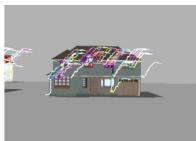
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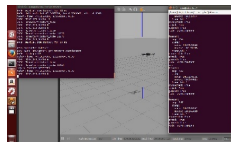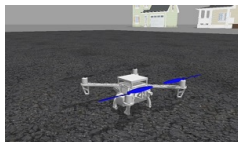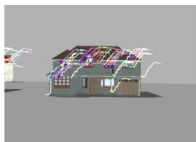
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- Instead, we considered the simpler problem of verifying how each waypoint was reached.

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Reachability analysis

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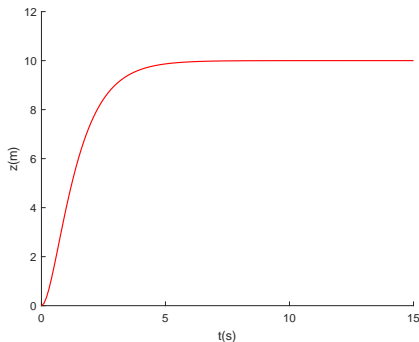
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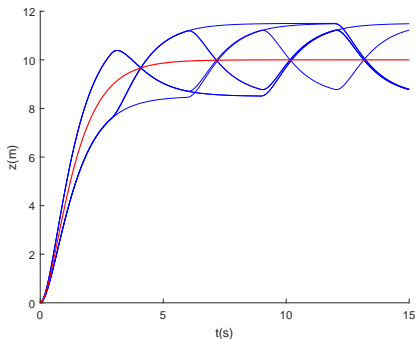- This is how the controller performs in the absence of wind:

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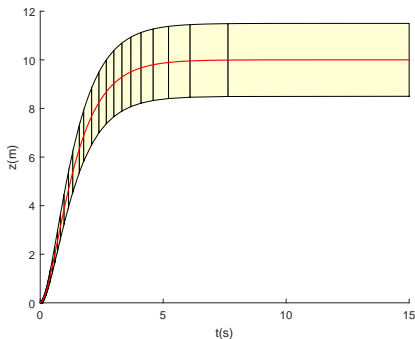- This is how the controller can perform in the presence of wind:

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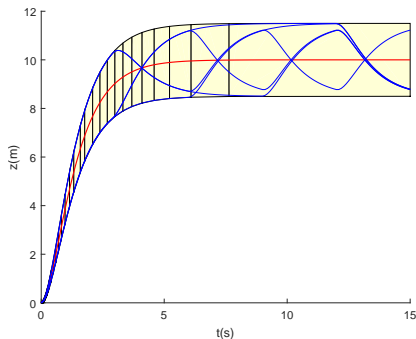- Over-approximation of the reachable set computed by SpaceEx:

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Lessons learned

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- They are very comfortable with reachability analysis when presented as an extension of simulation.
- The problem does not seem to reside with the concepts but with the mathematical formalism.
- We are considering making reachability analysis a pre-requisite to qualify for the final competition demonstration.