# Aviation in the context of complex systems

Airplanes are COMPLICATED systems. They take inputs and produce predictable outputs through mechanics, physics, or electromagnetics. A complicated aircraft makes up part of a COMPLEX system called aviation. The complicated aircraft operates in its predictable way; the result of that operation is related to the environment in which it exists.

Possible Research Questions

* Decision-making in the context of complex systems
* Training in the context of relationship to the task at hand (tool vs. task)
* Does it take longer to train a student to solo
* Training away automation bias
* Visual Landing Data
* Appropriate use of Automation and Decision Support Systems
* The basket under Reason’s Swiss Cheese

*Incentivized Simulation Experiment*

Goal is to find a way to incentivize pilots to complete the mission. Most simulation experiments look to evaluate performance as it relates to compliance or knowledge or resilience to malfunction. Suppose we give pilots a budget. They burn the budget with flying time or fuel. What’s left is theirs in $. The objective is to take advantage of the human condition of loss aversion to amplify the weight of perception over the weight of compliance under observation.

# References

## Collins J. February 6, 2018. What to do When Algorithms Rule. Behavioral Scientist: Technology. Retrieved 10/30/2019 from <https://behavioralscientist.org/what-to-do-when-algorithms-rule/>

* Humans take time to trust algorithms
  + Mercury astronauts
  + Self-driving cars

## Collins J. December 12, 2018. Simple Heuristics That Make Algorithms Smart. Behavioral Scientist: Technology. Retrieved 1/19/2021 from <https://behavioralscientist.org/simple-heuristics-that-make-algorithms-smart/>

* Algorithms are insensitive to bias – they offer consistent output for given inputs
* Heuristics are effective in dynamic, uncertain conditions where an input is not considered by the algorithm

## Cummings, M. (2004, September). Automation bias in intelligent time critical decision support systems. In AIAA 1st Intelligent Systems Technical Conference (p. 6313).

* Levels of automation
* Automation bias – decision maker dicregards or fails to search for contradictory information in light of computer generated solutions that are accepted as correct.
* How does this compare to faith in algorithms?

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