

## Humans in Aerospace

### Part I

A researcher was interested in understanding how changing the control interface for a manually controlled robot would affect task performance. The researcher recruited 11 participants and had all participants perform the task with control interface A, followed by control interface B. The researcher recorded the time it took to complete a representative task (see table below).

- At  $\alpha = 0.05$ , can it be concluded that the interface affected performance? You do not need to give an exact p-value, but state the bounds on the p-value.
- What does the p-value represent?
- What are potential confounding factors in this study design?

Table 1. Task time measures

Interface	Participant										
	1	2	3	4	5	6	7	8	9	10	11
A	13.0	14.5	15.2	12.8	14.0	14.9	14.7	13.2	15.8	14.1	14.9
B	12.6	14.0	15.2	13.0	13.5	14.2	14.8	12.7	16.0	13.2	14.5

### Part II

Discuss how Sheridan's Levels of Automation can vary by the different information processing stages. (Use the simplified four-stage model.) Give an example of how a drone could have low, medium, or high automation on each of the four stages. What level of automation would you recommend for a company that wants to use drones for agricultural monitoring of crops? How would your recommendation affect the operator's situation awareness of the drone, the environment, and potential additional tasks the operator may have?