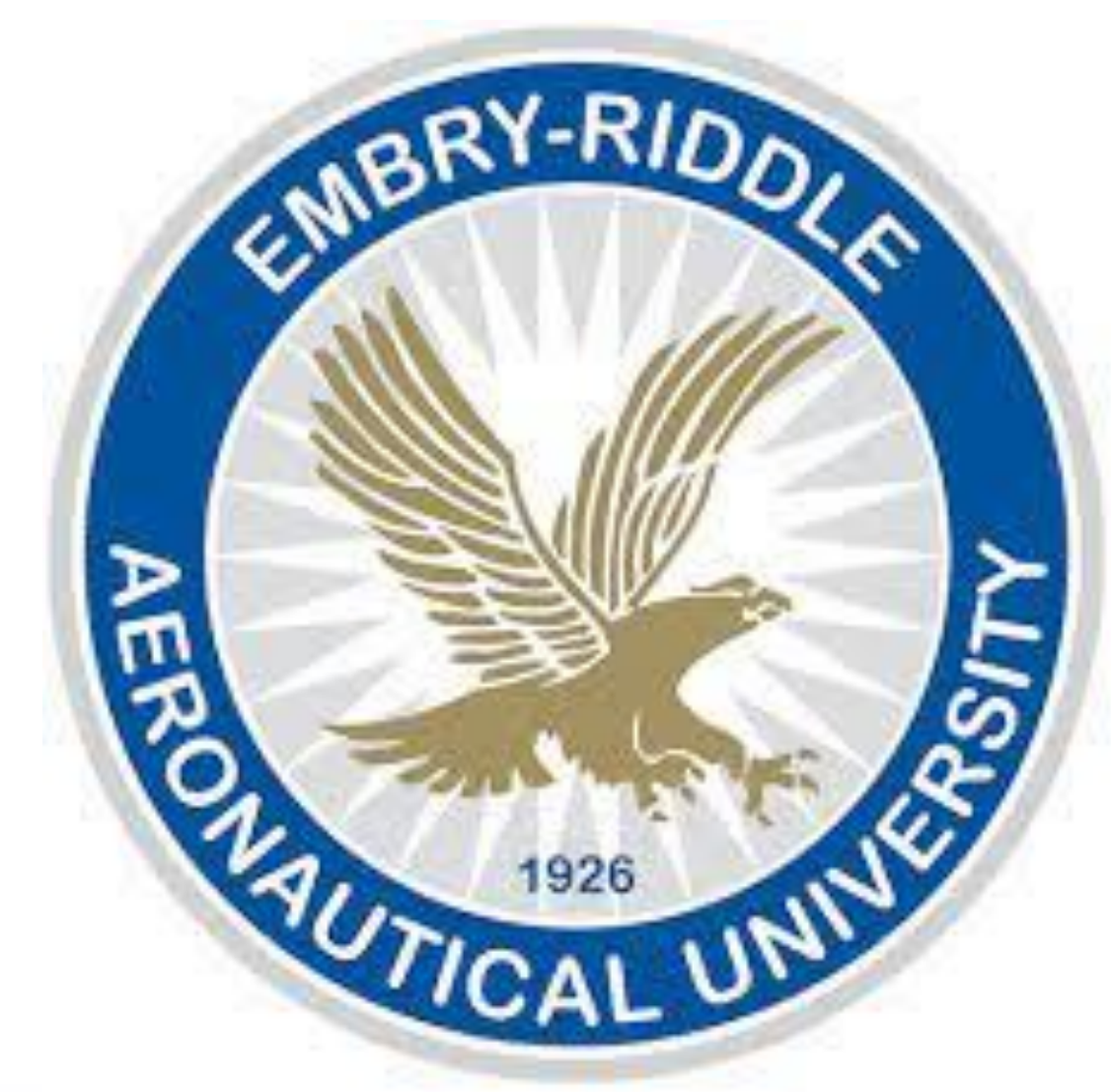# SITUATIONAL AWARENESS WHILE FLYING A UAV: A COMPARISON OF VIDEO GAMER AND NON-VIDEO GAMER PILOTS

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Introduction

- UAVs have been implemented in various industries which ultimately reduces human involvement in their operations.
- Increased automation can lead to an increase in mishaps or reduced safety, leading to reduced situational awareness (SA).
- The loss of SA or spatial disorientation is a relatively new human factors issue in UAVs due to increased mishaps To reduce the number of mishaps, multiple studies have researched operator selection to understand if preexisting skills in operators can help them fly a UAV better and safer
- This study aims to investigate the effect of pilots' VG playing habits on their SA while flying a UAV to help further the current research in this field.

Research Question / Hypothesis

The following research questions will be answered in this study.
- RQ1: What is the effect of habitual video gaming of pilots on their accuracy of responses to SA questions while flying a UAV?
- RQ2: What is the effect of habitual video gaming of pilots on their time taken to respond to SA questions while flying a UAV?
- RQ3: What is the effect of habitual video gaming on the SA of pilots?

The following hypotheses will be tested.
- H1: There is no significant difference in SA while flying a UAV between pilots who are VGPs and pilots who are NVGPs.
- H1a: There is a significant difference in SA while flying a UAV between pilots who are VGPs and pilots who are NVGPs.
- H2: There is no significant difference in the time taken to respond to SA questions between VGP and NVGP pilots while flying a UAV.
- H2a: There is a significant difference in SA while flying a UAV between pilots who are VGPs and pilots who are NVGPs.

Methodology

Sample
- Pilots with minimum PPL at ERAU
- NVGP pilots: < 1 hour a week of playing video games in the past 6 months
- VGP pilots: ≥ 5 hours of FPS games and < 3 hours of any other genre per week for at least 6 months prior.

Data Collection Device
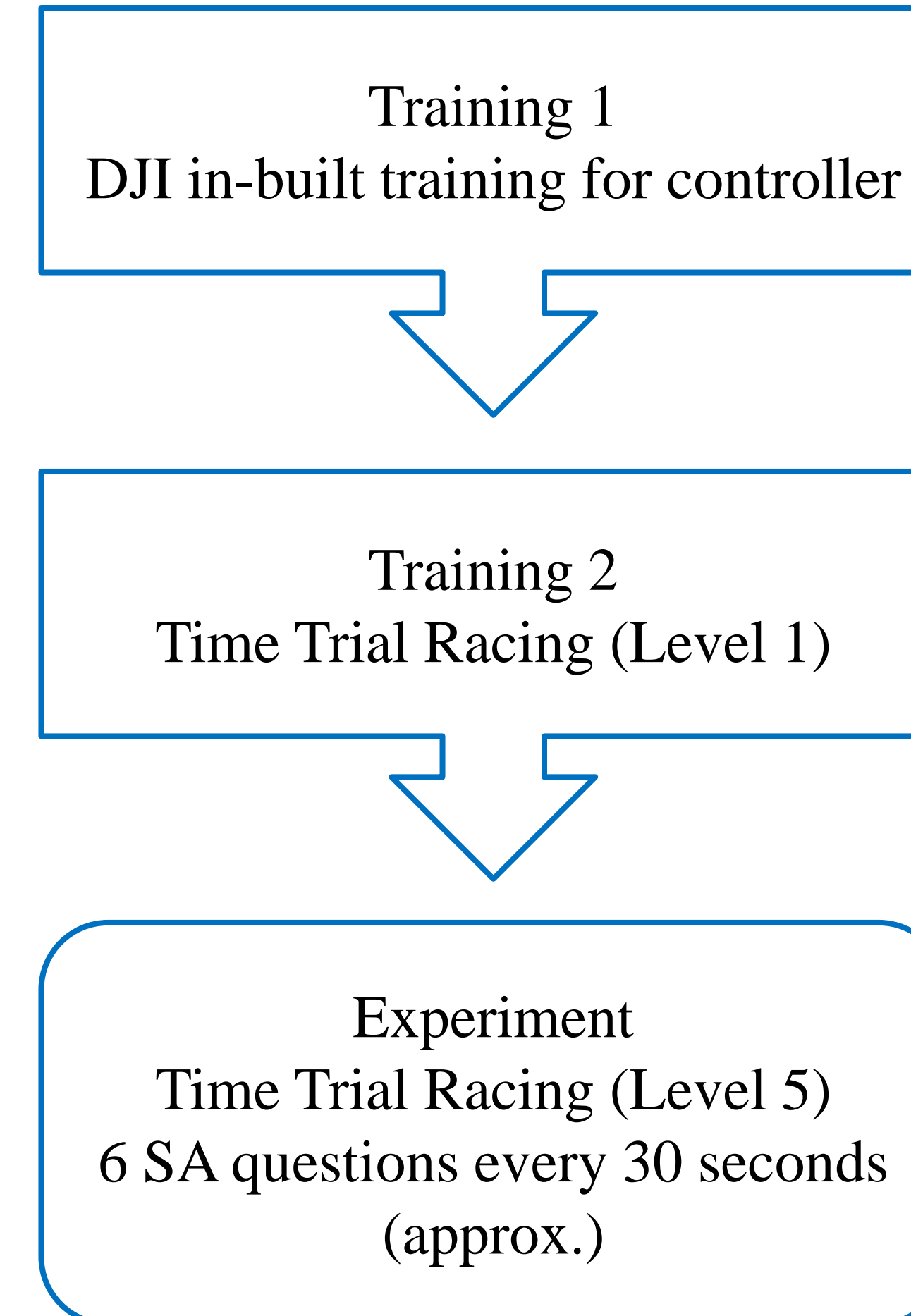- Audacity Software
- DJI Flight Simulator

Mavic 2 Pro Drone

DJI Flight Simulator controller

Procedure

Training 1
DJI in-built training for controller

Training 2
Time Trial Racing (Level 1)

Experiment
Time Trial Racing (Level 5)
6 SA questions every 30 seconds (approx.)

Results

- An independent samples t-test was conducted at the alpha level of .05.

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Total Response Accuracy	Equal variances assumed	3.194	.079	3.677	60	.001
	Equal variances not assumed			3.677	57.484	.001
Total Response Time	Equal variances assumed	17.251	.000	-4.773	60	.000
	Equal variances not assumed			-4.773	37.171	.000

- The mean of VGP total accuracy of responses (M = 3.74, SD = 1.06) to SA questions was larger than the mean of NVGPs total accuracy of responses (M = 2.84, SD = 0.86). Difference was significant, $t(60) = 3.677$, $p = .001$, Cohen's $d = .934$.
- The mean of VGPs total time taken to respond (M = 7.51, SD = 2.73) to SA questions was smaller than the mean of NVGPs total time taken to respond (M = 14.64, SD = 7.85). Difference was significant, $t(37.171) = -4.773$, $p < .001$, Cohen's $d = -1.212$.

Time Trial Racing Level 1

Discussion and Conclusion

- This study found that SA of gamer pilots is better than that of non-gamer pilots.
- This shows that the skills gained through prolonged video gaming experience (specifically FPS games) can be transferred to flying a UAV.
- The findings of this study may help organizations develop training methods that enhance SA.
- It may also address the essential characteristics or traits necessary for individuals to become proficient UAV operators, potentially reducing training time and costs.

References

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