

*Single Operator Control of Autonomous Multi-Vehicle Swarms*  
*Post-Experiment Questionnaire*

This questionnaire is automatically read by a computer program. Please use a pen for filling in your answers.

Check:  You can check any number of boxes in selection questions.

Uncheck to correct:  For questions with a range (1–5) choose the answer the mark that fits best.

## 1 Placement Aid

1.1 Helpfulness: How helpful was presence of the placement aid?

Very Helpful       Helpful       Neutral       Distracting       Very Distracting

1.2 How would characterize the placement aid's behavior?

- Predictable  
 Unexpected, but understandable in hindsight.  
 Unexpected, and even in hindsight rather odd.  
 Random

1.3 Looking back, if you would have the chance to use the aid in scenarios where you weren't given the option, would you have used it?

Yes       No

1.4 Do you think that the placement aid had a positive impact on your task performance?

Yes, I believe the aid helped me perform better.       No, I think the aid hindered my performance.       I am not sure, I don't think it helped or hindered me.

1.5 Aid Purpose: How would you describe your expectation towards the placement aid's purpose on a scale from *faster results*, which might not be optimal, to *better results*, which could be slower to compute?

Faster Results                   Better Results

## 2 Visual Interface

2.1 Looking back at the various visual elements of the interface, how would you rate the following items?

	Very Helpful	Helpful	Neutral	Distracting	Very Distracting
Gray Maximum Clearance Paths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green R/F Coverage Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outlined R/F Coverage Prediction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Black Field-of-View Indicator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COM Graph Indicator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.2 Overall, how would you rate the visual presentation of all that data?

Very Helpful       Helpful       Neutral       Distracting       Very Distracting

Single Operator Control of Autonomous Multi-Vehicle Swarms  
Post-Experiment Questionnaire

### 3 Piloting Interface

3.1 Which physical interface would you prefer to pilot your primary UAV?

- R/C Radio (the type you used)  Mouse and Keyboard (WSAD)  
 Gamepad-style Controller (comparable to a Playstation or Xbox controller)  Realistic Helicopter Replica (Cyclic Joystick, Collective/Throttle Lever, and Rudder Peddals)

### 4 Background

4.1 **Demographics:**

Age:  Gender Identity:

4.2 **Education:** What is your current student status or your highest degree obtained?

- Undergraduate  Graduate  Doctoral  Post-Doctoral

4.3 **Field:** In which field did or will you get this degree?

Please write down the name of your field and categorize it as either being a part of STEM (Science, Technology, Engineering, Mathematics) or not.

Name:   STEM  not STEM

4.4 **Training:** Have you had any sort of military or law enforcement training?

- No  Yes

4.5 **Tactical Lead:** If you answered *Yes* to military or law enforcement training above, have you directly led a small unit in a tactical situation in training or active duty/combat?

- No  Yes  N/A (answered *No* in question 4.4)

### 5 UAV/UAS Operator Experience

For the purpose of the questions in sections 5 and 6 the differentiation of UAS operation and R/C flight is by the capability of the controlling interface to guide the air vehicle through means other than direct manipulation of (aerodynamic) control surfaces.

Example: The simulation you just used would qualify as UAS operation as were able to control the aircraft through drag and drop with the mouse. A system that only provides an interface comparable to the joystick control of the primary UAV (i.e. no map overview and/or waypoint control) would only qualify for R/C flight operation (independently of the possible level of input augmentation/stabilization).

5.1 **UAS Operations:** Do you have any experience in operating Unmanned Aerial Vehicles/Systems?

- No  Yes

If you answered *No*, please continue at question 6.1. If you answered *Yes*, please also answer the following questions.



*Single Operator Control of Autonomous Multi-Vehicle Swarms*  
*Post-Experiment Questionnaire*

5.2 **Operator Role:** What was your primary role as an operator?

Pilot

Payload/Systems

Other:

5.3 **Experience:** How much total time have you accumulated (in any role) as a UAS operator?

Hours:

## 6 Radio Controlled Flight Experience

For the purpose of the questions in sections 5 and 6 the differentiation of UAS operation and R/C flight is by the capability of the controlling interface to guide the air vehicle through means other than direct manipulation of (aerodynamic) control surfaces.

Example: The simulation you just used would qualify as UAS operation as were able to control the aircraft through drag and drop with the mouse. A system that only provides an interface comparable to the joystick control of the primary UAV (i.e. no map overview and/or waypoint control) would only qualify for R/C flight operation (independently of the possible level of input augmentation/stabilization).

6.1 **R/C Flying:** Do you have any experience in radio controlled flight?

No

Yes

If you answered *No*, please continue at question 7.1. If you answered *Yes*, please also answer the following questions.

6.2 How often do you fly radio controlled aircraft on average?

daily

a few times a week

a few times a month

a few times a year

at most once a year

6.3 When did you actually fly radio controlled aircraft the last time?

today

this week

last week

this month

last month

I actually haven't flown in a long time

6.4 Which type of transmitter configuration are you used to?

Mode 1

Mode 2

Mode 3

Mode 4

6.5 How would you rate your experience/comfort/skill in radio controlled flight?

Novice/Beginner

Casual

Average

Proficient

Expert

## 7 Video Game Experience

7.1 **Mouse Gaming:** Do you have any experience with mouse-based real time strategy games?

(Examples: Warcraft, Total Annihilation, Command and Conquer, Starcraft, Age of Empires)

No

Yes

If you answered *No*, please continue at question 7.5. If you answered *Yes*, please also answer the following questions.

*Single Operator Control of Autonomous Multi-Vehicle Swarms*  
*Post-Experiment Questionnaire*

7.2 How often do you play mouse-based strategy games on average?

- daily                       a few times a week                       a few times a month                       a few times a year  
 at most once a year

7.3 When did you actually play a mouse-based strategy game the last time?

- today                       this week                       last week                       this month                       last month  
 I actually haven't played in a long time

7.4 How would you rate your experience/comfort/skill using a mouse as a game interface?

- Novice/Beginner     Casual                       Average                       Proficient                       Expert

7.5 **Joystick Gaming:** Do you have any experience with gamepad or joystick based games?

- No                       Yes

If you answered *No*, please continue at question 4.4. If you answered *Yes*, please also answer the following questions.

7.6 How often do you play gamepad-based games on average?

- daily                       a few times a week                       a few times a month                       a few times a year  
 at most once a year

7.7 When did you actually play a gamepad-based game the last time?

- today                       this week                       last week                       this month                       last month  
 I actually haven't played in a long time

7.8 How would you rate your experience/comfort/skill using a gamepad-style controller as a game interface?

- Novice/Beginner     Casual                       Average                       Proficient                       Expert

## 8 General Feedback

8.1 If you could add pre-programmed behaviors, what would you add?

- "Go to Building"                       "Build R/F Cover"                       "Follow me"                       "Inspect Building"

other:

8.2 Which part of the system did you have the most trouble with?



*Single Operator Control of Autonomous Multi-Vehicle Swarms*  
*Post-Experiment Questionnaire*

8.3 Which part of the system would you consider the most helpful?

8.4 How would you expand the system's capabilities? Are there features that you have been missing?

*Single Operator Control of Autonomous Multi-Vehicle Swarms  
Post-Experiment Questionnaire*

Intentionally left blank.

