qvscribe for Microsoft Word

Document Name: UxAS_Reqs.docx

Date Analyzed: July 29, 2017 at 3:31PM **Total Requirements:** 88

Score Summary

Score	# of Reqs.	Percentage	What should I do?
5	53	60%	**Looking good,** move along!
4	0	0%	**Review it!** Check the flow and clarity of the requirement.
3	12	13%	**Revise it!** Replace negative or amibguous terms with clear and concise ones.
2	0	0%	**Rewrite it!** Focus on what needs to happen and choose clear and unambiguous terminology to re-express the requirement.
1	23	26%	**Rethink it!** Consider what the requirement is trying to convey and rewrite it as one concise requirement, or as separate multiple requirements.

Analysis Breakdown

	Percentage	# of Reqs.	Color Highlighting
No Imperatives	25%	22	No Highlight
Vague Words	17%	15	Brown
Optional Words	9%	8	Yellow
Multiple Imperatives	1%	1	Light Blue
Negative Imperatives	1%	1	Blue
Excessive Continuances	1%	1	Purple
No Directives	N/A	N/A	No Highlight

Individual Requirements

Score: 1

No Imperatives

A reusable framework is needed to support a broad class of autonomous ISR missions using unmanned assets — including unmanned aircraft.

Score: 5

The framework must enable distributed, multi-agent cooperative control in a comms-denied environment.

Score: 1

Excessive Continuances

Multiple Imperatives

Vague Words

Universal Quantifiers

The framework must be modular, must be computationally efficient and run on modest hardware, and must allow capabilities such as mission planning, path planning, and surveillance tasks to be efficiently developed and rapidly updated and replaced before the start of each ISR mission.

Score: 5

The framework must optimize tasks for mission-time efficiency.

Score: 5

The framework must ensure safety and security.

Score: 5

The framework must facilitate formal verification and validation.

Score: 5

1-UxAS shall enable cooperative control

Score: 5

2-UxAS shall support multiple agents

Score: 5

3-UxAS shall be distributed

Score: 5

Universal Quantifiers

25-UxAS shall operate when there is no comms

Score: 5

4-UxAS shall operate in the presence of lost comms

Score: 5

5-UxAS shall operate in the presence of denied comms

Score: 5

6-UxAS shall be modular

Score: 3

Vague Words

7-UxAS shall be computationally efficient

Score: 5

8-UxAS will run on modest hardware, e.g., cell-phone sized processor

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Score: 3

Vague Words

35-UxAS shall allow tasks to be efficiently developed

Score: 1

No Imperatives

11-Example tasks include mission planning, path planning, and surveillance

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Score: 5

26-UxAS shall allow configurations to be rapidly modified before the start of a mission

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Score: 1

No Imperatives

Universal Quantifiers

9-Configuration modification includes task update before the start of each mission

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Score: 1

No Imperatives

Optional Words

27-update may mean that the component satisfies its contract in a new way

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Score: 1

No Imperatives

10-Configuration modification includes task replacement before the start of a mission

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Score: 1

No Imperatives

Optional Words

28-replace may mean that the contract has been changed and the configuration needs to be re-analyzed

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Score: 5

12-Configurations shall optimize tasks for mission-time efficiency

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Score: 5

13-Configurations shall ensure the safety of agents

Score: 1

No Imperatives

39-Safety includes collision avoidance, health monitoring, contingency planning (safe route home for lost comms)

Score: 5

14-Configurations shall ensure security

Score: 1

No Imperatives

30-Security includes integrity & confidentiality of comms

Score: 1

No Imperatives

31-Security includes integrity & confidentiality of onboard data

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Score: 1

No Imperatives

32-Security includes availability of computing resources

Score: 5

34-UxAS shall facilitate formal verification and validation

Score: 5

15-UxAS shall be employ a service-oriented architecture

Score: 1

No Imperatives

35-The service oriented architecture provides the basis for configurations

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Score: 5

16-Configurations shall ensure schedulability of tasks

Score: 5

17-Configurations shall ensure timeliness of task execution

Score: 5

33-Configurations shall ensure timeliness of message delivery within an asset

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Score: 5

18-Configurations shall guarantee non-interference amongst services under nominal hardware configurations

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Score: 5

19-Configurations shall provide time partitioning of services

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Score: 5

20-Configurations shall provide space partitioning of services

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Score: 5

21-Configurations shall provide resource partitioning of services

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Score: 5

22-For example, configurations will schedule direct-memory access

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Score: 5

23-Configurations shall provide a message-passing interface for inter-service communication

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Score: 3

Vague Words

24-Configurations shall provide a standard interface for all services

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Score: 1

No Imperatives

Vague Words

SYS1-For every Unique Automation Request, the system produces a response (which might be an error message).

Score: 1

No Imperatives

Optional Words

Vague Words

SYS2-Every task included in a request should be in the response or an error should be produced.

Score: 5

SYS3-The system shall respect airspace constraints

Score: 5

Universal Quantifiers

SYS4-No path produced will intersect with a no fly zone.

Score: 1

No Imperatives

Optional Words

SYS5-Vehicles should stay in Keep In Zones

Score: 1

No Imperatives

Optional Words

Vague Words

SYS6-If there is a feasible assignment (mission solution), we should find it.

Score: 1

No Imperatives

Optional Words

Vague Words

SYS7- If the process algebra relationship is valid (well-formatted), then we should adhere to it.

Score: 1

No Imperatives

SYSA2-Vehicles altitudes are distinct and differ by at least X ft

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Score: 3

Negative Imperatives

SYS8-Vehicle altitudes shall not be changed during the mission

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Score: 1

No Imperatives

SYS10-The costs of tasks and mission are influenced by vehicle altitude

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Score: 5

SYSA1-If a map update is sent by the user, that user will also determine when to force a replan (for the entire system).

Score: 1

No Imperatives

Optional Words

SYS9-Assignment cost matrix coming out of route aggregator service should be #vehicles* # task options + # vehicles* (#task options)^2.

Score: 5

SYS10-Message IDs shall be unique system-wide throughout a mission

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Score: 5

SYS11-Route planner shall be configured with vehicle configuration data before a route plan request is sent (or received)?

Score: 5

SYS12-Messages shall be received in the order in which they were sent

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Score: 5

SYS13-The system shall propagate error messages to the final recipient

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Score: 1

No Imperatives

Universal Quantifiers

SYS14-For each request sent, a response (possible an error) is received and that response corresponds to that request.

Score: 5

P2-The configuration shall report an error if an automation request is received but the requested resource has not been defined

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Score: 1

No Imperatives

P3-Resources include Tasks, Vehicles and Regions

Score: 5

P4-The configuration shall generate a UniqueAutomationRequest message if an AutomationRequest is received and the requested resource has been defined

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Score: 5

P5-The configuration shall publish UniqueAutomationRequest messages in the order in which they are generated

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Score: 5

P7-The configuration shall publish one UniqueAutomationRequest message and wait for a corresponding UniqueAutomationResponse message to be received

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Score: 3

Vague Words

Universal Quantifiers

P8-The configuration shall publish the next UniqueAutomationRequest message immediately if there is no outstanding UniqueAutomationResponse message

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Score: 3

Optional Words

P9-Optionally, the configuration shall publish the next UniqueAutomationRequest if the outstanding UniqueAutomationResponse message has not been received within a set time

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Score: 5

P10-The configuration shall publish an AutomationResponse message in response to the corresponding AutomationRequest message when a corresponding UniqueAutomationResponse message is received

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Score: 5

P11-The configuration shall ensure that only one AutomationRequest is executed at a time

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Score: 5

Universal Quantifiers

RA1-The configuration shall create a unique RoutePlanRequest message for each vehicle ID in each RouteRequest message received

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Score: 3

Vague Words

Universal Quantifiers

RA2-The configuration shall send each RoutePlanRequest message to the planners that are appropriate for the associated vehicle type

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Score: 5

RA3-The configuration shall correlate RoutePlanReponses with RoutePlanRequests

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Score: 3

Vague Words

RA4-The configuration shall send a RouteResponse message when all RoutePlanResponses are received for a particular RouteRequest

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Score: 5

Universal Quantifiers

RPV1-The configuration shall generate a route for each pair of start and end locations specified in each RoutePlanRequest message received

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Score: 3

Vague Words

RPV2-Route generation shall be efficient

Score: 5

RPV3-Route generation shall be responsive

Score: 5

RPV4-Routes shall be approximately distance optional

Score: 5

RPV5-Routes shall respect vehicle limitations

Score: 1

No Imperatives

RPV6-Vehicle limitations include minimum turn radius constraints

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Score: 3

Vague Words

RPV7-The configuration shall send a RoutePlanResponse message using return-to-sender addressing when a route has been generated for all pairs of start and end locations specified in the associated RoutePlanRequest message

Score: 3

Vague Words

RPV8-The configuration shall take environment and vehicle constraint information from appropriate inputs

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Score: 5

SR1-UxAS shall ensure communication is only between intended services.

Score: 3

Vague Words

SR2-UxAS shall ensure data is only accessible to services with appropriate authority.

Score: 5

Universal Quantifiers

SR3-UxAS communication channels shall be always avaiable to intended users.

Score: 5

SR4-UxAS will filter out garbage data from communication channels.

Score: 5

SR5-UxAS shall detect the authenticity of incoming messages.

Score: 5

SR6-UxAS will detect if an attacker resends an old message.

Score: 5

SR7-UxAS will encrypt communications.

Score: 5

SR8-UxAS shall verify received messages are from a source authorized to send the given message type.
