

2016 Software and Simulation Score Sheet

Purpose: To document the software design process and practices used for creating and testing the robot program. (25 Points)

SOFTWARE DESIGN PROCESS (85 points)

Evidence that a software design process was followed



<i>Look For</i>	<ul style="list-style-type: none"> • Identifying the required operations (e.g., locomotion/drive, chassis rotate, arm lift/bend/rotate/extend, claw rotate/open) • Designing each required operation (e.g., flow charting the steps involved, consideration of user interface, etc.) • Coding and Verification (how correct operation of the robot program was verified) • Release and Maintenance (version control, managing changes/updates)
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21-30	A software design process with multiple steps is clearly identified; there is evidence that the process was followed.
11-20	A software design process is evident, however all steps were not followed.
1-10	There is minimal evidence of software design, and no clear process is identifiable.
0	No evidence of a software design process.

<i>Comments:</i>	Possible Points 30	Points Awarded
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Evidence of custom software design versus using the default robot program

11-15	Team obviously developed a fully customized robot program from scratch.
6-10	Some program changes were likely made to the default program or an example program.
1-5	Team clearly used only the default program code.
0	No mention of default code vs. customized code.

<i>Comments:</i>	Possible Points 15	Points Awarded
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Evidence that advanced simulation techniques were utilized to verify correct program operation

11-20	Clear evidence is shown that software was simulated through a simulation environment (such as Simulink, External Mode, Virtual World).
1-10	Simulation was discussed but its use was not clearly shown or explained.
0	No mention of advanced simulation.

<i>Comments:</i>	Possible Points 20	Points Awarded
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Evidence that test and debug techniques were used to verify correct program operation

6-10	Clear evidence that test and debug techniques were considered (debug terminal, print to screen, real-time debugger, external mode/in-the-loop)
1-5	Test & debug seemed limited to trial and error testing of the program on the robot.
0	Test and debug was not mentioned.

<i>Comments:</i>	Possible Points 10	Points Awarded
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Team Number: _____ School: _____

The program functionality is connected to the teams' scoring objectives/strategies.

6-10	Program functionality is clearly connected to all of the teams' scoring strategies/objectives.
1-5	Program has connection to at least one of the teams' scoring strategies/objectives.
0	Program has no connection to the teams' scoring strategies/objectives or strategies/objectives are not identified.
<i>Comments:</i>	
Possible Points	
10	
Points Awarded	

SOFTWARE DESIGN PRACTICES (40 points)

Consideration of good software design practices

<i>Look For</i>	<ul style="list-style-type: none"> • Code commenting • Variable/function naming conventions • Code simplicity (no unnecessary functionality) • Code modularity/maintainability (use of functions/procedures, tasks, subsystems; use of variables vs. hardcoding values, etc.)
11-15	Three or more design practices listed above were considered.
6-10	Two design practices listed above were considered.
1-5	One design practice listed above was considered.
0	No mention software design practices.
<i>Comments:</i>	
Possible Points	
15	
Points Awarded	

Consideration of error conditions and response actions.

<i>Look For</i>	<ul style="list-style-type: none"> • illegal operations, invalid states, out of bounds values, motor/servo stop limits, etc.
8-15	At least one error condition and response action was discussed.
1-7	Error condition(s) were mentioned; response action(s) were not.
0	No mention of error conditions or checking.
<i>Comments:</i>	
Possible Points	
15	
Points Awarded	

CLARITY OF DESIGN AND DESCRIPTION (10 points)

6-10	Well written/clear/logical, easy to follow thought process, no excess material/information
1-5	One or two things that are unnecessary, lacking, or unclear
0	Poorly written and presented. Unable to follow.
<i>Comments:</i>	
Possible Points	
10	
Points Awarded	

SCORE CALCULATION

<i>Additional Comments:</i>	Total	125	
		÷5	÷5
	Final Score	25 max	

Judge name/number (print): _____

Team Number: _____ School: _____