2015 MS Training Session 1
Questions and Answers

General Questions

Note: There is a new "thread" for you to ask questions using the website.
Go to: http://zerorobotics.mit.edu/ -> Resources -> Forum

Q1: Is the Webinar recorded?
A: if you have sites that cannot attend this or other web-based trainings, please know that we are recording these training sessions, and you will be able to use the recordings at any future date --- Wendy will coordinate with you if you need additional help beyond the recording (especially if there is a need for a QA period)

Q2: Will you be sending this powerpoint? / Can we please get a link for the recording of this webinar?
A: Information Forthcoming will include: 1.) Power Point Slides. 2.) Q and A Document. 3) Link to the webinar recording.

Q3: Can you talk about some of the research that is currently going on with the SPHERES on the ISS?
A: SPHERES is being used for two main research areas. 1) Assembly/servicing of satellites, where one "servicer" or "module" has to dock to another one and keep the new large system in control. 2) Vision based navigation, where satellites use cameras to learn the shapes of each other and move around.

Q4: Where can I find the pdf of the paper SPHERES for making a SPHERE?
A: Links to materials are here:
- directions: http://zerorobotics.mit.edu/docs/ms/MakeYourOwnSPHERE.pdf
- image: http://zerorobotics.mit.edu/docs/ms/PaperSPHERE.pdf

Links to these materials are available in the Educator guide p.25 and in the student materials for week 1.

Q5: What were some of the games played by students in previous years?
A: 2013: RetroSPHERES_MS: Goal: Space debris clean up
2014: CosmoSPHERES_MS: Goal: Deflect a virtual asteroid's path away from earth

Q6: Is Internet Explorer supported?
A: Internet Explorer is not recommended. We suggest using Firefox or Chrome.

Q7: How do we find out about high school registration (For the high school tournament 2015 which starts in September?)

A: The High School Registration Link will be available on the ZR Homepage in June. We will also send a follow up email to our partners in MS when it is live.

Math/Coding Questions

Q8: How much of the math is covered in the educator guide?

A: All of the concepts that are being presented right now have activities and/or handouts in the guide.

Q9: On the robot taking the shortest path: do we do that or does the robot do that?

A: The satellite will know the shortest path, you only need to indicate the coordinates to go to.

Q10: Question about how the "loop" block works. How does it loop?

A: The "loop" runs once every second. Whatever is in the loop will be run every second from start to finish.

Q11: What would happen if you changed the "initial" values when setting up the set position on the init page? //Q: We're wondering if you could explain again why we set position1 in the init page and then set the position again on the main page.

A: You can set the initial values in the "init" page and use them normally. We show the example of setting them in the "main" page since it is also useful to know how to change values of variables.

Q12: Could you tell us what the simulator measures velocity in?.What about angles?

A: The simulator is in metric units, meaning position is in meters [m] and velocity in meters per second [m/s]. The angles do not have units, they represent "how much in X and how much in Y" to point to.

Q13: Could you clarify the meaning of attitude?

A: "attitude" is the technical term for "pointing in a direction". It is the 3-element array that defines how you are pointing (how much in X, how much in Y, how much in Z)

Q14: What is the point of rotating?

A: Rotating will be needed to help you point the satellite so that you can get points in the game.

Q15: Does attitude affect how you assign a position target?

A: "setAttitude" and "setPosition" are independent of each other, you can use them at the same time or at different times and they will be independent. In other words: you *can* rotate and translate at the same time if you want to.

Q16: Do Nx, Ny, Nz have to be "normalized"?

A: No, you do not. I don't want to confuse people with what "normalized" means, so the easy way to explain it is: you can enter into Nx and Ny any coordinates that you want the satellite to point to.

Q17: Why do you use "counter + 1" instead of the increments?
A: You can use either "counter + 1" (which is more generic to teach how to increment things), or you can use increment instead (++). In our experience for MS students (new programers in general) they first need to understand "counter + 1" before "++" makes sense.

Q18: Can you set up blocks in a way to detect a position and then do an action?// Is there a way for SPHERES to tell where the opposing SPHERE is?
A: Yes you can detect your or the opponent's satellite position using the functions getMyZRState or getOtherZRState.

Q19: What does the "init" section of the global variables block do/control?
A: This is not used in/covered by the middle school curriculum. (The "init" block of the "init" page (below "global variables") is used to run functions only once at the start of the game - this is usually used if students create their own functions (Note that this does not apply to the procedural functions which are introduced later in the middle school curriculum))

Q20: I accidently right-clicked (the white space) and hit collapse, but now I can't do anything...how do I get it back?
A: This problem was fixed by right-clicking on the white space and selecting Expand. If instead the block had been accidentally collapsed then click on the block and select Expand.

2015 MS Game questions

Q21: Do the poi's change locations for each of the 3 phases of the game?
A: The POI's will not change locations in this game, but they "reset" every minute. You can only take one picture from each zone each minute; you have to wait until the "next" minute after taking a picture to get points again.

Q22: Can you explain traveling off the grid to the shadow zone? Can you move through the non-gridded area without an out of bounds penalty, on your way to the shadow zone?
A: Yes you will not be considered out of bounds for the acting out the game activity when you move to the shadow zone

Q23: Are collisions between spheres possible in this game scenario, like in sharing the shadow zone? Or are we separated in the z plane?
A: Yes, collisions are possible. However, the SPHERES Satellites will take over control if they sense a collision by enabling their collision avoidance response which moves the satellites apart if needed. Additionally/However - If positioned carefully, both satellites can fit in the shadow zone. And assume this is true when "acting out the game"

- Response: Ohhh...the one image in the game overview appeared to indicate a lack of real estate. :) Thank you!
- Reply: Sorry, the slide in the presentation shows only the most important area of the game; the game zone is almost square (not quite, but almost), so there is a lot of real estate both "in front" of the asteroid (to take pictures) and "behind" (in the shadow zone)

Q24: So...another team "hogging" the shadow zone could bounce us out? Or would it screw things up for both to provide incentive to play well with others?

A: There is the possibility of "hogging" the shadow zone; however, you don't get any points while there (there are no POI's there), so this is only one part of "game strategy"

Q25: Are the flares random, or will they always occur at the same time?

A: FLARES: right now for today's training the flares are fixed, but when the students start to play the flares will be random (but not in the first minute of the game and never closer than 30 seconds apart from each other - details will be in the manual - please review the details when it comes out in the next couple of weeks)

Q26: We had a question: if you pick up a memory stick, do you get to keep that memory for the whole round (so if you upload three pictures, you'd get three memory stick back?)

A: Yes, once you have 3 memory slots if you upload three pictures, you'd get three memory slots back through the rest of the game

Q27: We were also wondering if you could explain a little bit about how fuel is used in the game

A: Fuel usage: you are allocated fuel at the start of the game. every time the satellite has to move it uses some fuel. the exact math of how the fuel is used is quite complex, so we recommend that instead you do some basic tests to see how fast you use fuel (which depends on how fast you move)

Q28: When will we have access to try the game out (with the asteroid) before we work with the students.

A: A preliminary version of the game is available now. When you create a new project instead of “Free Mode” select the Game: CoronaSPHERES_MS_2D.

Q29: Wondering if the debug functions correctly with get new flare? When I use the 'getNextFlare' command, and then try to print it using the debug "NextFlare in %d",NextFlare, it returns a 12 digit value, not a -1...until the next flare, and then it returns a different 12 digit number...not a 30 second countdown as expected. Is this working correctly at this time?

A: is "NextFlare" an integer variable? Please confirm that when you defined it (in the init page) it is an integer.

- Response: That was it! Thanks!