2 Aug, 2018

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**Progress Report – 1 Jul 2018 – 31 Jul 2018**

Contract Number: HSHQDC-06-D-00022

Contract Number 7500097279

Order Number: HSCG23-07-J-TED150

Task Order – Performance Work Statement (PWS) 1.12

Attachments: (1) SAROPS subcontractor financial reports.

1. **Lots of Sprints and Points meetings. Plus a 2-day IPR**
2. **Did all modifications on the West Coast. Reported them at the IPR and the process to create them. Eventually they were all accepted with no revisions. I think that with Google Earth and an intern, I could remake the world. At least what Sim thinks of as land.**
3. **Upgraded my IDE. Surprisingly annoying since the profiler (YourKit) did not upgrade smoothly. Wound up uninstalling and re-installing the entire thing. At least I have a clean install now.**
4. **Several overhauls of Sailboat voyage. I wrote an auxiliary “program” so I could demonstrate what I meant when I said that “adding the current to each polar can cause the order of the polars to change.” I had mentioned that fact on a call and several people said that they’d have to see it to imagine it. I used the auxiliary program to examine the polars for the 1st particle of the 1st time step of the 1st case that Robert sent me. This combination of polars and currents exhibited the problematic behavior. In spades. It was an unusual “real case” because the currents were very strong. But it demonstrated several things:**
   1. **Polars can change order.**
   2. **High standard deviations cause some particles to exhibit this behavior.**
   3. **Strong currents, especially with weak winds and/or “poor sailors” can cause this.**
   4. **Non-intuitive ordering of the polars result.**

**That it was unusual doesn’t make it any less necessary to deal with. To minimize the impact of this, Art decided we should drop the standard deviations for the environment for *all* cases, which I have done in Sim.properties.  
Unfortunately the auxiliary program also exposed other surprising behaviors. I’ll describe one here. Suppose we have a strong current so that sailing SE still results in a net movement to the NW, and so the polar corresponding to SE will be a very small vector pointing to the NW. If there was a polar pointing to the NW, it “dominates” the SE one; nobody is going to go NW by pointing his boat SE if he can point his boat NW. Hence, the SE polar needs to be “culled” or else, when we interpolate for a COG close to 315, we would pull that SE polar in.  
I finished the 1st draft of that program the night before the IPR and I noticed this problem and two others while I was talking at the IPR. I fixed those problems, presented these ideas at a WebEx, and this fix is in the Jul27 release.**

1. **Red herrings were chased down; for example, different object types can indeed affect the initial distribution because different object types have a different number of random numbers generated prior to the placement of the particles, and that’s not a bug. When explained, that’s acceptable, but I have changed my code for the next release so that this behavior does not occur.**
2. **Along those lines, I cleaned up the random number generator code so that the “latestSeed” part of planner is more consistent with the rest of the code; basically I had an “in-code” value for the default seed, where it should rely exclusively on the Sim.properties or xml value. Unfortunately, I had “lastestSeed” in Sim.properties so that was an easily fixed bug.**
3. **Jack reported a problem in the Jun20 release (2018.6); starboard tacks were heavily preferred. That behavior is not present in my Jul27 release (2018.7). Since Jul27 is several drafts later, I’m not surprised that it works better.**
4. **Other than Item 6 above, I don’t recall any reported problems that I hadn’t already fixed. Maybe selective memory is kicking in.**
5. **Worked with Jack and Art on the “5-minute rule,” but only as a consultant relating what is there now.**
6. **Worked hard on comparing Eval between 2.1.1 and 2.2. One has to take the 2.1.1 particles file AND the 2.1.1 Eval xml file and give it to 2.2, and let 2.2 generate eval\_plannerdashboardtables.xml, then compare the two eval\_plannerdashboardtables.xml files. Kind of messy.**

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| **Name** | **Activity Worked** | **Hours Worked** | **Hourly Cost** | **Total Cost** |
| Kratzke | Coding/Doc/Travel | 191.69 | -- | -- |
|  |  |  |  |  |
| **Totals** |  | 191.69 |  |  |
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