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**Progress Report – 1 Jul 2016 – Jul 31 2016**

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. **Started with a week of vacation.**
2. **When I got back, there were new values for creep direction and track spacing being sent as part of a (frozen) pattern. It’s not the ideal way of passing that information, which is used for ESS and coverage/area calculations respectively. It did expose the fact that any box communicated is always a “Track-spacing” box (or “TS-box”). The TS-boxes that *could* have been communicated with a pattern before were intended as exclusion boxes and, since we now always have “Buffer-Boxes” defining exclusion areas instead of TS-boxes, we cannot communicate an exclusion box. As it turns out, we never using the “Here’s-a-pattern-and-use-this-box-as-an-exclusion-area” feature anyway, but it does mean that the code reading the TS-Box should be purged. I can’t yet since that’s where these new parameters are being passed.**
3. **FWIW, I think that creep-direction (which is used only for ESS) should be on the individual legs anyway, and should be called “look-direction” or something like that. ESS could conceivably be deployed on something other than a ladder-pattern and, for such a pattern, we cannot communicate which legs are looking left, right, or neither.**
4. **Related to that, I infer whether a set of waypoints (pattern-type SRU in Plan and completed search in Sim) is a ladder pattern, with my own simple algorithm, and get creep and track spacing from those if they’re not given (and they are not in Sim’s completed searches)**
5. **Finished the “Eliminate first-turn-right bias” code. To understand this, consider a simple PS example with (orientation,firstTurnRight) = (0,true). Its 4 “cousins” are all PS, and have (orientation,firstTurnRight) = (0,true), (180,true), (0,false), and (180,false). Now, I simply take the best “cousin” for that Sru, ignoring the other Srus, and that’s the one that Planner uses. I think that it was Mr. Mewhorter who brought up the first-turn-right bias with me during a break at the IPR.**
6. **Unfortunately, when I put this code in, it exposed a bug; if I am given, for a starting box, a CS pattern that has an illegal length/width ratio, I will crash. I fixed that.**
7. **I’ve had a latent bug. Planner was computing good boxes, but the reported POS values were low. I was running Planner on one particular old case; the boxes looked better than 203 boxes, but the POS values were lower. I finally got this cleaned up. It had to do with the fact that ESS now requires me, when computing CPA, to restrict myself to subinterval(s) of the leg. At one critical point, I was looking at the SRU’s position at the beginning and ending of the entire interval instead of the beginning and ending of the subinterval. BTW, if we consider the minimum distance value to mean “distance from SRU” instead of “distance from trackline,” there can be 2 subintervals. Otherwise, there’s at most one.**
8. **Area and coverage calculations had to be cleaned up. Planner never needs an area except for making reports. Planner now leans as much as it can on sw/ts for its definition of coverage. Sw is always given. If there is a TS (see items 2, 3, and 4), I will use that. Otherwise, I will but a buffer of a ½-TS around the pattern, take the convex hull, use that for an area, and compute area-effectively-swept, and report AES/Area for coverage. I think we got that cleaned up and cleared up with some code changes and an exchange of email with Jim.**
9. **I put a new GetStatus/Sru message in as mentioned at the IPR. I tested this, but it won’t be used on Judy’s side until post 2.1.**
10. **Some crashes that were easily fixed. At least twice this happened.**
11. **I was not reporting overlap correctly. During optimization, if there are two *frozen* SRUs that illegally overlap, I don’t count it. During report-generation, I have to report it. When I converted to buffered-boxes-overlap as opposed to TS-boxes-overlap, I slipped a stitch, and lost this. I got that fixed, I think. At least, there was a case where TotalOvlV was 0 before the fix and TotalOvlV was positive after the fix.**
12. **Short note here on the difference between TotalOvlV and TotalOvl. In 203, overlap between 2 Srus was measured as the area of the intersection between their respective TS-boxes (for an irregular pattern, I had to invent a buffer and use a convex hull; similar to what I do now, but the buffer is given) and was positive or 0. In 21 (and this is a very critical but very subtle change), overlap is measured by “how far do I have to move a box to clear the overlap?” This quantity can be positive (bad), 0 (they’re clear, but barely), or negative (they are really clear). In the new version, TotalOvlV means the sum of the bad ones. TotalOvl would be ambiguous so I don’t use that term anymore and Judy has changed her code accordingly. Nobody will notice this change is how overlap is measured, but it is vital for Planner to optimize based on (StartingPoint, length of first leg, length of second leg) instead of optimizing based on (CenterPoint, Length of box, Width of box). Indeed, this, together with the buffer replacing the track-space, are the major components of the infrastructure improvements necessary for the umbrella entry in CGTRK.**
13. **While making these changes, a typo spoiled my overlap measurements; Judy found a suspicious case and I fixed it quickly enough.**
14. **Working with Rob now to get a big planner case that is kind of an omnibus test of the most difficult Sim and Plan features; Great Lakes, restrict self to water-only, ESS, multiple scenarios with a different number of Srus than scenarios, etc. Have found an anchoring problem in the Great Lakes, and will fix that in early August.**
15. **I put rounding back into my Pattern-maker that Jim uses. That’s tricky, but I think I have it, and it seems to now be working to Jim’s satisfaction.**

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| **Name** | **Activity Worked** | **Hours Worked** | **Hourly Cost** | **Total Cost** |
| Kratzke | Coding/Doc/Travel | 143.5 | 282 | 40467 |
| Vergamini | Coding/Doc/Travel | 0 | 282 |  |
| Stone | Doc | 0 | 223 | 0 |
| L White (Tech Writer) |  | 0 |  | 0 |
|  |  |  |  |  |
| **Totals** |  | 143.5 |  | 40467 |
|  |  |  |  |  |