

# EVOLUTIONARY TASK FORCE

---

## SUMMARY OF WEEK 11 (9 - 15 JANUARY 2012)

---

The most important thing to report is the physical meeting we held in Stuttgart on January 11. The main goals of the meeting were: 1) To review and document the progress we have made since the forming of this cluster. 2) To make specific plans towards the demo and the joint publication(s). The detailed minutes of the meeting are under 'Home' on <https://symbrion-ec.wikidot.com/>

As for the plans, the major milestones are the following:

- Early March 2012: written document for the Annual Progress Report
- Early May 2012: presentation on the 4<sup>th</sup> annual review meeting
- Summer 2012: conference paper(s)
- Fall 2012: journal paper(s)
- Winter 2012/2013: big journal paper (Nature, Science, PNAS ?)

This time line shows that we can go on with comparative experimental studies till early March, summarize the results for the Annual Progress Report, and make the final decisions on the details of the demo. Then we still have two months to perform the demo run(s) and make some movie(s).

As for the progress, the most essential points to mention are as follows.

### Subtask-force 1 (morphogenesis)

5 approaches had been investigated. 3 are using an explicit representation of the organism shape (1 from Wenguo/Christopher, 2 from Yaoyao based on GRNs) and 2 are using an implicit representation (Ronny's Virtual Embriogeny and Michele's Cellular Automata). NB. The minutes on the wiki categorize one of Yaoyao's methods as implicit, but later on it turned out to be explicit too. We decided to use Wenguo's approach for the demo. We left the option open to try one of the implicit ones too, but could not decide which one. The subtask-force needs more time to look into the options.

### Subtask-force 2 (organism control)

We converged on 3 independent approaches, AHHS (Graz), GRN (Yaoyao), CGP (Evert, Florian, Jean-Marc), and the combo approach using a "super-controller" or "big switch" that chooses one of them to be THE active controller governing the organism. We will study all four, report on all four, and choose one for the demo after the written report is finished.

### Subtask-force 3 (internal rewards)

We will use distance as a fitness measure for the demo, because it leads to much better results than the other options. This subtask is completed.

### Subtask-force 4 (simulator)

A lot has been achieved, often invisible "under the hood". Special thanks for everybody helping with this rather unthankful job! There is also more work needed for a more realistic evolutionary demo, regarding sensors, docking, energy usage, etc. These needs become clear as we go...

We had the idea to shift the focus and to change the name of sub-task 4 to Integration and Joint Experimentation. However, it seems better to leave sub-task 4 as it is and make Integration a new sub-task. Jean-Marc is prepared to be the spokesperson for this. This sub-task will become increasingly more important the coming weeks.