CLAIMS

1. A simulation-based Computer Generated Force (CGF) system for tactical training in a training field comprising:

a receiver for receiving information on the training field;

a database for storing a library of CGF behaviours for one or more robots in the training field;

a CGF module, coupled with the receiver and the database, for processing the information on the training field and selecting a behaviour for each of the one or more robots in the training field from the library of CGF behaviours stored in the database;

a controller, coupled with the CGF module, for sending commands based on the selected behaviours to the one or more robots in the training field; and

a behaviour refinement module, operationally coupled with the CGF module, for adjusting and refining the selected behaviours by generating datasets of virtual image data for a computer vision algorithm;

wherein the information on the training field includes location of one or more trainees and the commands include shooting the one or more trainees.

2. The simulation-based CGF system in accordance with claim 1, wherein the datasets comprises real image data captured by passive imaging cameras.

3. The simulation-based CFG system in accordance with claim 1, wherein the computer vision algorithm comprises a model-based computer vision algorithm.

4. The simulation-based CGF system in accordance with claim 1, wherein the behaviour for each of the one or more robots in the training field comprises collaborative behaviours with other robots so that the one or more robots can conduct organizational behaviours.

5. The simulation-based CGF system in accordance with claim 1 or claim 4, wherein the behaviour for each of the one or more robots in the training field comprises collaborative behaviours with the one or more trainees so that the one or more robots can conduct organizational behaviour with the one or more trainees.

6. The simulation-based CGF system in accordance with claim 5, wherein the collaborative behaviours comprises communication in audible voice output through a speaker system or through a radio communication system.

7. The simulation-based CGF system in accordance with any one of the preceding claims, wherein the information received by the receiver comprises one or more of the following inputs: (i) 3D action parameters of robot, (ii) planned mission parameters, (iii) CGF behaviours and (iv)robot-specific dynamic parameters including max velocity, acceleration and payload.

8. The simulation-based CGF system in accordance with any one of the preceding claims, wherein the database is comprised in the one or more robots.

9. The simulation-based CGF system in accordance with any one of the preceding claims, wherein the database is comprised in a remote server.

10. The simulation-based CGF system in accordance with claim 1, wherein the behaviour refinement module is configured to generate datasets of virtual image data for machine learning based computer vision algorithm to adjust and refine the behaviours.

11. The simulation-based CGF system in accordance with any one of the preceding claims, wherein the library of CGF behaviours stored in the database comprises simulation entities and weapon models.

12. The simulation-based CGF system in accordance with any one of the preceding claims, further comprising a pedagogical engine for selecting behaviour and difficulty level based on computer vision detection of one or more trainees' actions.

13. The simulation-based CGF system in accordance with any one of the preceding claims, further comprising a computer vision-based target engagement system, the computer vision-based target engagement system comprising:

a camera for detecting and tracking a target;

a laser beam transmitter for emitting a laser beam to the target; and

a processor, coupled with the camera and the laser beam transmitter; for computing a positional difference between the tracked target and an alignment of the laser beam transmitter and instructing the laser beam transmitter to adjust the alignment to match the tracked target.

14. The simulation-based CGF system in accordance with claim 13, wherein the computer vision-based target engagement system further comprises a receiver, coupled with the processor, for receiving a feedback with regard to accuracy of laser beam emission by the laser beam transmitter and providing the processor with the feedback.

15. The simulation-based CGF system in accordance with claim 13 or 14, wherein the alignment of the laser beam transmitter is adjusted by rotating a platform of the laser beam emitter.

16. The simulation-based CGF system in accordance with any one of claims 13 to 15, wherein the camera comprises one or more of the following cameras: single camera, multiple camera, multiple view camera and 360 view camera.

17. A method for conducting tactical training in a training field, comprising:

receiving information on the training field;

processing the information on the training field;

selecting a behaviour for each of one or more robots in the training field from a library of CGF behaviours stored in a database;

sending commands based on the selected behaviours to the one or more robots in the training field; and

generating datasets of virtual image data for a computer vision algorithm to adjust and refine the selected behaviours;

wherein the information on the training field includes location of one or more trainees and the commands include shooting the one or more trainees.

18. The method in accordance with claim 17, wherein the computer vision algorithm comprises a model-based computer vision algorithm.

19. The method in accordance with claim 17, further comprising generating datasets of real image data captured by passive imaging cameras for the computer vision algorithm to adjust and refine the selected behaviours.20. The method in accordance with claim 17, wherein selecting the behaviour comprises selecting collaborative behaviour with other robots so that the one or more robots can conduct organizational behaviours.

21. The method in accordance with claim 17 or 20, wherein selecting the behaviour comprises selecting collaborative behaviour with one or more trainees so the one or more robots can conduct organizational behaviours with the one or more trainees.

22. The method in accordance with claim 17, wherein selecting the collaborative behaviour comprises communicating in audible voice output through a speaker system or through a radio communication system.

23. The method in accordance with any one of claims 17 to 22, further comprising engaging target using computer vision, the engaging comprising:

detecting a target;

tracking the detected target;

computing a positional difference between the tracked target and an alignment of a laser beam transmitter;

adjusting the alignment to match the tracked target; and

emitting a laser beam to the target from the laser beam transmitter.

24. The method in accordance with claim 23, further comprising receiving a feedback with regard to accuracy of the laser beam emission from the laser beam transmitter.

25. The method in accordance with claim 23 or 24, wherein the adjusting the alignment comprises rotating a platform of the laser beam transmitter.

26. The method in accordance with any one of claims 23 to 25, wherein the computing comprising computing a positional difference of geo-location information in a geo-database.

27. The method in accordance with any one of claims 23 to 26, wherein the detecting comprising range and depth sensing including any one of LIDAR and RADAR.