

CLAIMS:

1. A tactical advanced robotic engagement system (ARES) comprising:
a heads-up display (HUD) mounted on a helmet of a user;
a weapon or tool having a hand-operable controller mountable on the weapon or tool; and
an unmanned ground vehicle (UGV) and an associated unmanned aerial vehicle (UAV) or unmanned underwater vehicle (UUV);
wherein the HUD, the hand-operable controller, the UGV and UAV or UUV are in communication links, and the HUD and the hand-operable controller allow operation of the ARES by reducing visual and mental cognitive loads on the user, enhancing the user's situation awareness, enhancing decision making with reduced risks, and allowing the user to maintain mission-critical, time-critical or safety-critical readiness, thereby to achieve task effectiveness and mission success.
2. The tactical ARES according to claim 1, wherein the hand-operable controller provides switch buttons for switching communication links with the UGV, UAV or UUV, a manoeuvre button for pre-set navigational control of the UGV, UAV or UUV and two speed and directional control buttons, with the two speed control buttons being operable simultaneously for hover control of the UAV or UUV, thereby providing quick response to effective navigation control to the user.
3. The tactical ARES according to claim 2, wherein the hand-operable controller further comprising a joystick for directional control and homing of the UAV or UUV to the UGV, where homing allows the UAV to return and dock with the UGV for battery charging.
4. The tactical ARES according to any one of claims 1-3, further comprising a dead-reckoning algorithm and an AI algorithm, wherein the dead-reckoning algorithm allows the ARES to track and guide the user when GPS is ineffective in a built-up area, and the AI algorithm allows inputs from various sensors deployed in the UGV, UAV or UUV to recommend execution of a strategy plan with low risks and high effectiveness.

5. The tactical ARES according to claim 4, wherein the dead-reckoning algorithm and AI algorithm functionalities are built into the HUD, UGV or a command centre.
6. The tactical ARES according to any one of the preceding claims, wherein the HUD mounted on the helmet has up-down and forward-retract adjustments to allow a better fit to the user according to the user's head and eyes profiles.
7. The tactical ARES according to any one of the preceding claims, wherein the HUD comprises a health and electric power monitor to notify the user in order to achieve mission success or to reduce mission failure.
8. The tactical ARES according to any one of claims 4-7, wherein the UGV, UAV and HUD have sensors that provide positional nodes, so that locations on the GPS map can be determined with predetermined accuracies.
9. The tactical ARES according to any one of the preceding claims, further comprising a camera mounted on the UAV or UGV for taking photos or videos of a target area or object-of-interest, wherein the photos or videos are transmitted to the HUD or an associated command centre for stitching together to create a strategy map for mission planning.
10. The tactical ARES according to claim 9, further comprising an AI algorithm built in the UGV or the HUD or the command centre to provide one or more mission routes with minimised risks and to achieve mission success.