



Royal Higher Institute for Defence

Defence-related Research Action - DEFRA

ACRONYM: STATS

Title: Sensing & Testing Analytics Toolbox for Soldiers
to predict fatigue and reduce injuries, infections and attrition rate

Duration of the project: 1/12/2022 - 1/12/2024

Key words: blended coaching, AI-based predictions, continuous monitoring, early warning, test battery

Budget: 1.303 k€

of which RHID contribution: 1.200 k€

PROJECT DESCRIPTION

“People Our Priority” (POP) has been put forward in the strategic vision and agendas of the Minister of Defense (Ref: Policy Note Oct 29th 2021, Doc 55/2294/008). The physical and mental health and fitness of military personnel is paramount for the efficiency of the core business of this Organisation. Attrition in recruits, the burden of burnout, inadequate fitness levels and food intake, fatigue, injuries and diseases can challenge the efficiency of the Organisation. Timely detection of what could go wrong is not easy. It is, for example, difficult to accurately monitor performance/fatigue (and detect health-related issues) and there are also still a lot of injuries amongst recruits and military personnel. STATS will investigate how objectively measured sensor data and specific military performance assessments can ease/facilitate the early detection of suboptimal function and dysfunction at physical, mental or health level.

The fully automated continuous collection of data with wearables and a data transmission system with an AI-based platform for “blended coaching” must guarantee that this approach is applicable for large numbers of individuals. In the blended coaching system, the professional experts in the different pillars are supported by AI-algorithms, though it is the expert who takes the decisions and who is in the driving seat. We are convinced that process knowledge is of crucial importance. The quantity of data will never compensate for the lack of quality and the absence of process knowledge. Blended coaching allows professional experts to manage large numbers of individuals, i.e. STATS will bring the resulting information to professionals in 4 pillars (physical fitness, mental readiness, infection risks and nutrition & hydration) and facilitate their tasks. By participation of defence experts (from HMRA-MHRA + in-kind commitment of VIPER/RMA) that are active in each of these pillars, the ROI will also be very high.

Since we are aware of the obstacles associated with collecting and interpreting accurate large datasets, an important aspect of STATS will be to make the sensors and platform ready-to-implement in a military setting. In the different project phases we will iteratively decrease the workload for staff/soldiers by:

- easing the process to capture/collect data,
- limiting the amount of wearables/devices (end goal: all-in-one),
- providing one central platform with data of the 4 pillars,
- making the visualisations/results easy to interpret.

By means of active learning, the platform will over time also limit the interactions/interventions by experts to those that really matter at that moment. In this way we aim to go from a 1-on-1 advice to a 1-on-100 support - creating more time to focus on those individuals who really need support.

The STATS consortium consists of a unique mix of sensor experts, data scientists, sports scientists, health experts and military personnel. Such a mix of research, industry and defence is needed to tackle the multidisciplinary challenges that the STATS project will be facing. The research partners will contribute their AI expertise (IDLab), research on prevention of injuries (REVAKI) and energy monitoring (PACE). These will be shared with all other project partners, tailored to the background of the partner. The optimization of wearables/sensors to objectively monitor soldier performance will be performed by IDRO and Biorics, taking into account the insights gathered by Revaki, PACE and the participating defence partners from each of the 4 pillars. The field tests and data model insights will frequently provide them new input/feedback for further improvement. This should in the end lead to the successful integration and demonstration of the STATS toolbox (for improved readiness to perform prediction) in training and OPS.

Overall, STATS is a real-time monitoring and management system to get Ready To Perform Soldiers. This compares to top sports where athletes must be ready to perform every day – a domain where several of the project partners are already active for years.

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LINK(S)

<https://sportsdatascience.be/projects/STATS.html>
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