Human Performance Research network (HPRnet)

https://www.dst.defence.gov.au/partner-with-us/university/human-performance-research-network-hprnet

HPRnet was established in 2016 through Army funding to help to address its top Human Performance research requirements, and has recently expanded to address a renewed set of Human Performance research priorities for Army, Navy and Air Force. The performance of its people and their ability to adapt and prevail in future operational scenarios is a critical factor in building and sustaining the ADF's capability edge. HPRnet brings together leading research teams from academic institutions across Australia to provide cross-disciplinary expertise to enhance the performance, physically and cognitively, of military personnel. Based on a model of mutual investment and open engagement, the aim of the network is to establish an enduring partnership with, and between, the Human Performance Research community.

Enhanced Human Performance is one of the key S&T themes identified in the Defence White Paper 2016. HPRnet resources are allocated from the DST, Army, Navy and Air Force and the Next Generation Technologies Fund. Human Performance is a priority for our international partners and we are pleased to announce that plans are in place to expand this investment through a co-contribution from the US Office of Naval Research (ONR).

Partnering is only available to Australian Universities who are signatories of the Defence Science Partnering (DSP) Deed with budgeting undertaken according to costing provisions in the DSP using Research Rate 2.

In addition to the traditional 4 year studies, HPRnet also supports a rolling set of 1-2 year studies targeted at more specific outcomes. HPRnet also provides a mechanism for setting up studies funded directly by military stakeholders.

Sponsored studies demonstrate technical expertise and a scientifically sound approach and also demonstrate a clear advantage to Defence outcomes and a commitment to true partnership.

Sponsored projects are assessed and down selected by an expert panel from DST Group and its military stakeholders and assessed against the "NICER" criteria, defined below:

- Necessary: unlikely to be undertaken without Defence investment
- Invested: involves meaningful co-investment
- Connected: evidence of an openness to working with Defence and the broader HPRnet
- Excellent: involves researchers with an excellent track record of delivering high quality research
- Relevant: clearly mapped to stated research priorities

HPRnet is interested in fostering and building true partnerships. Cross-university discussion and alignment of projects is encouraged. As such, the following are looked upon favourably when considering projects:

- Demonstrated capability and experience in the nominated question(s) from the ADF's Human Performance priorities, including design and ethics, data collection, analysis, interpretation and peer-reviewed publications.
- Provision of a suitable qualified academic chair (0.1 FTE) to participate in the HPRnet panel.
- Ability to attract suitability qualified research personnel and thereby rapidly stand-up the capability.
- Signatory of the Defence Science Partnering Deed.
- Provision of appropriate students and scholarship/s in areas of mutual interest to augment the research program.
- Competitive co-funding proposals for academic support to the programme.

The ADF's Research and Development Requirement Questions

The ADF's Human Performance AMLE requirements have been based on a comprehensive framework. The framework sets out four interconnected research "streams" [Body/Mind/Tools/Group]. Defence seeks to focus the scientific experts within the disciplines associated with these broad streams on delivering research outcomes that would have application at specific stages of the operational lifecycle of Defence personnel [Prepare/Perform/Recover]. The HPRnet is focussed on the research questions related to the Prepare and Perform elements of the operational lifecycle as listed below.

Cognitively Prepared (CP) [*How can the ADF…*]

CP1 - Select and prepare individuals to make effective decisions in challenging operational conditions?
CP2 - Select and prepare adaptive and resilient individuals to perform effectively in challenging operational conditions?
CP3 - Prepare teams to operate effectively in challenging operational conditions?
CP4 - Deliver effective, affordable, training and feedback tailored to the learning opportunities of individuals within teams?
CP5 - Achieve tailored training outcomes through the application of immersive technology and tools?
CP6 - Make use of synthetic teammates to reduce the size of the personnel footprint required for effective collective training?

Cognitively Augmented (CA)

CA1 - Exploit emerging information systems to reduce cognitive burden and enhance performance in challenging operational conditions?
CA2 - Mitigate the performance decrements of personnel on sustained operations?
CA3 - Exploit wearable technologies to enhance and track cognitive performance and behaviours?
CA4 - Team personnel with autonomous systems to increase combat effectiveness?
CA5 - Enhance cognitive performance through nutrition and supplementation?
CA6 - Make sense from complex information from multiple sources of variable reliability to inform military decision making?
CA7 - Increase the capacity for accurate and timely decision making by distributing the load across and team and software agents?
CA8 - Overcome battlefield deception and uncertainty and apply them for military advantage?

Physically Prepared (PP)

PP1 - Select and prepare personnel to be physically resilient for roles conducted in challenging operational conditions?
PP2 - Exploit emerging methods to optimise the physical performance in challenging operational conditions?
PP3 - Optimise nutrition and feeding systems to enhance performance in challenging operational conditions?

Physically Augmented (PA)

PA1 - Reduce the physical burden on combatants through emerging technologies?
PA2 - Continually develop and improve platforms, individual equipment & clothing to survive and thrive on operations?
PA3 - Exploit wearable systems to enhance and monitor physical performance?
PA4 - Exploit emerging food and drug technologies for the enhancement of physical performance and resilience?
PA5 - Exploit emerging bio-enhancement technologies for the optimisation of physical performance and resilience?