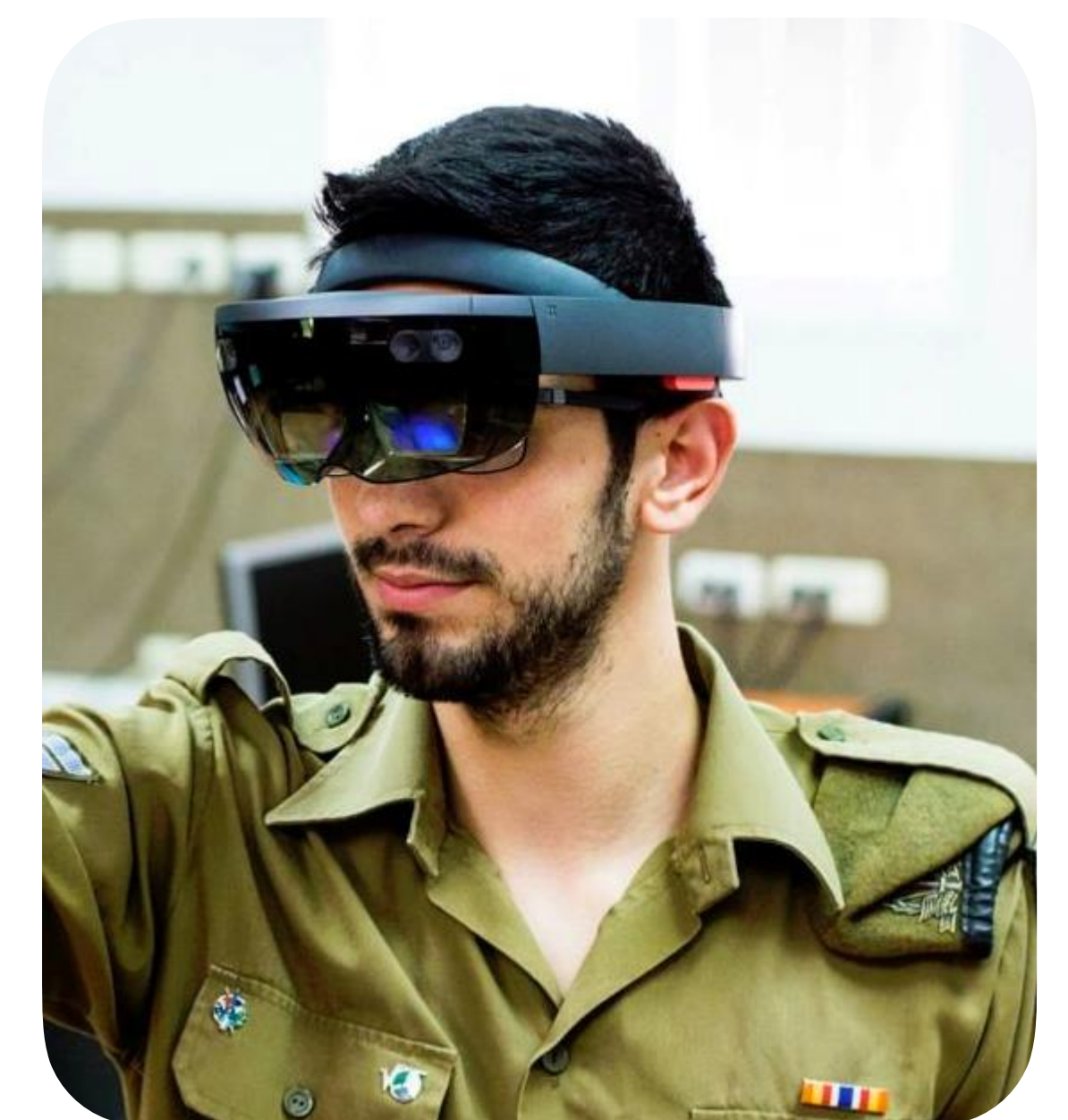
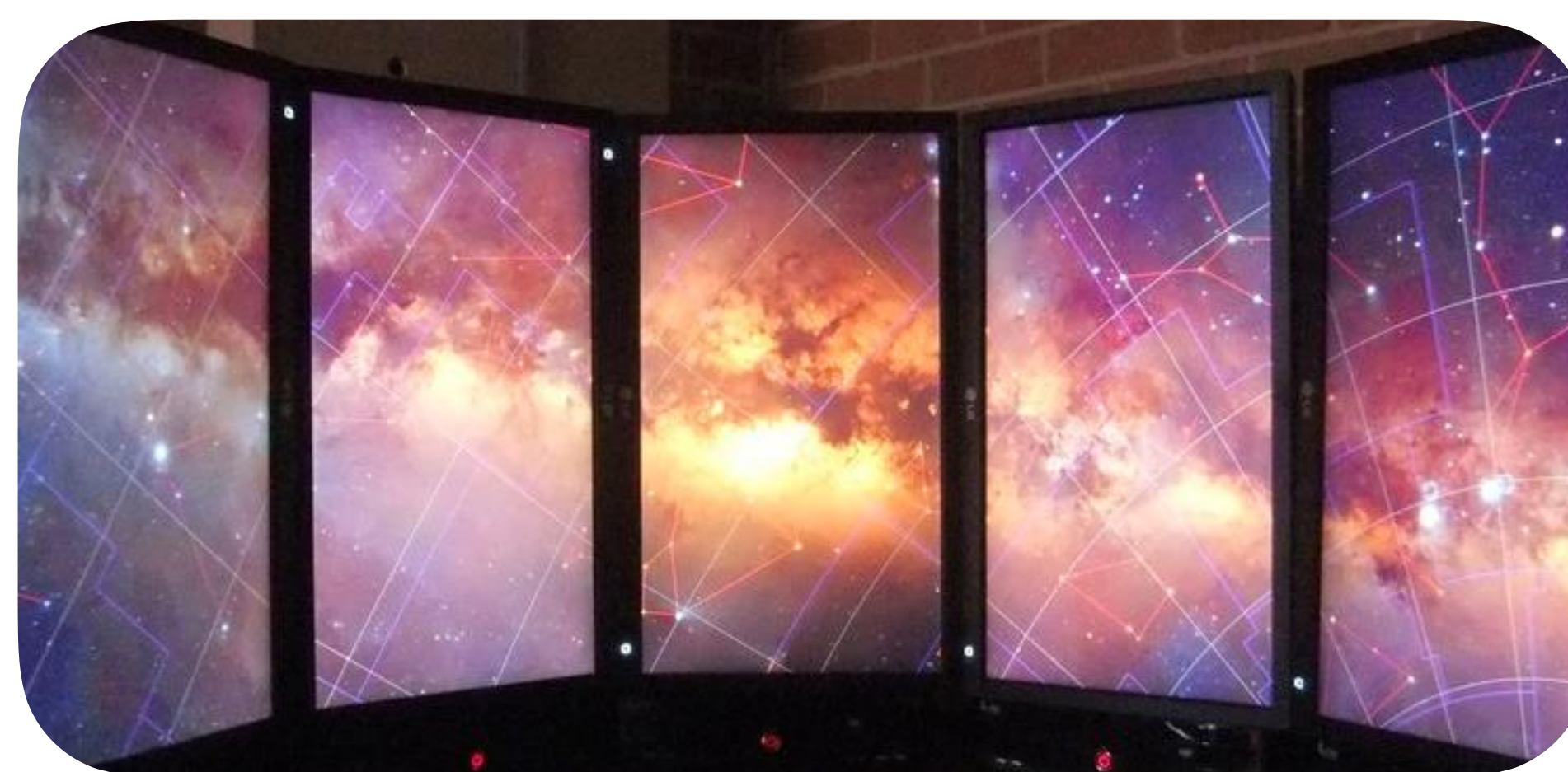




# Perceptual & cognitive optimisation of visual augmented reality displays in simulated combat environments



## Purpose

- To evaluate the effects of cognitive load induced by augmented reality (AR) on simulated combat performance
- To produce an augmented reality system that is optimised to the perceptual demands of simulated combat tasks
- To evaluate the effects of stress (via electric shock) and AR-induced cognitive load via a suite of physiological indices (pupil diameter, functional Near Infrared Spectroscopy (fNIRS))



## Product

- An AR display optimised to the perceptual constraints of the human visual system (retinal locations, size, shape, contrast, colour)
- An AR display which adapts in response to physiological signifiers of cognitive load and stress (changes in pupil diameter, cortical HbO2 level)

## Schedule

- FY19-20: Generation and initial testing of AR and battlefield task using VBS3 in VR headset displays
- FY20-21: Transposition of battlefield and AR tasks to virtual cave (Liquid Galaxy/) + HoloLens environments using Unreal game engine.
- Behavioural data collection using HoloLens + virtual cave with 50 civilian subjects
- FY21-22: Implementation and measurement of physiological indices of stress and cognitive load: eye tracking and fNIRS
- Main study: Lavarack Barracks n=50
- FY22-23: Data analysis, final reporting of findings to Defence and academic communities

## Partners

- Western Sydney University: Gabrielle Weidemann, John Cass
- DST: Larissa Cahill, Ryan Dummin