

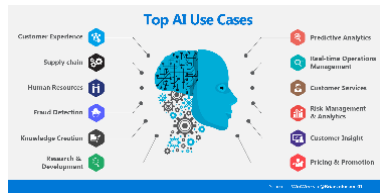


# Cognitive Warfare

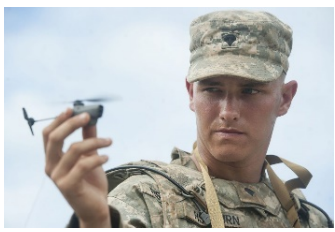
## A battle for the brain

PBM HFM HFM-RSY-334

Applying Neuroscience to Performance: From Rehabilitation to Human Cognitive Augmentation



# Background



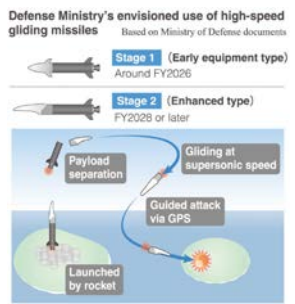
AI

Quantum

Autonomy

## EDTs

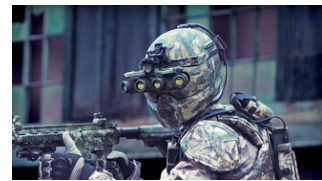
Data



Hypersonic

BioTech & Human Enhancement

Space



Emerging Sciences and Technologies introduce new threats and opportunities in the Cognitive Dimension

Innovation Hub Study on CW 2020



# Plan

- Defining the Cognitive Warfare
- The weaponization of Neurosciences
- A new domain of Operations?



# From Information to Cognitive Warfare

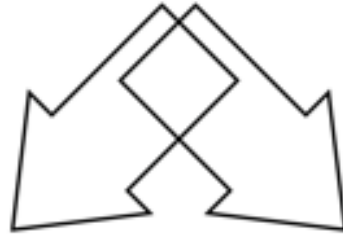
*“Hyper-connectivity created the opportunity to transform Information Warfare from a set of episodic activities, [...] into a **single continuous effort to disrupt and deny the cognitive conditions in which whole societies are situated.**”*

Dr. Zac Rogers, in *The Cove*, 2018

# PSYOPS vs. Cognitive Warfare



Exploitation of the error of rationality



Motivated influence

Cognitive disability

PSYOPS Domain

Cognitive Warfare Domain

Action on beliefs  
Distorted perceptions  
Cultural illusion  
Anxieties and fears  
Personality weaknesses or strengths  
Repression...

Action on cognitions  
Sensory and perceptive overflow  
Attentional saturation  
Tunneling of attention  
Errors of judgment  
Cognitive biases...

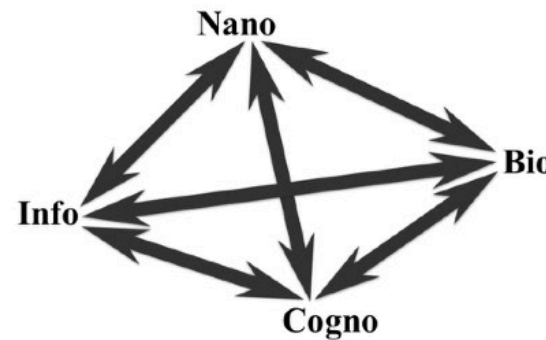
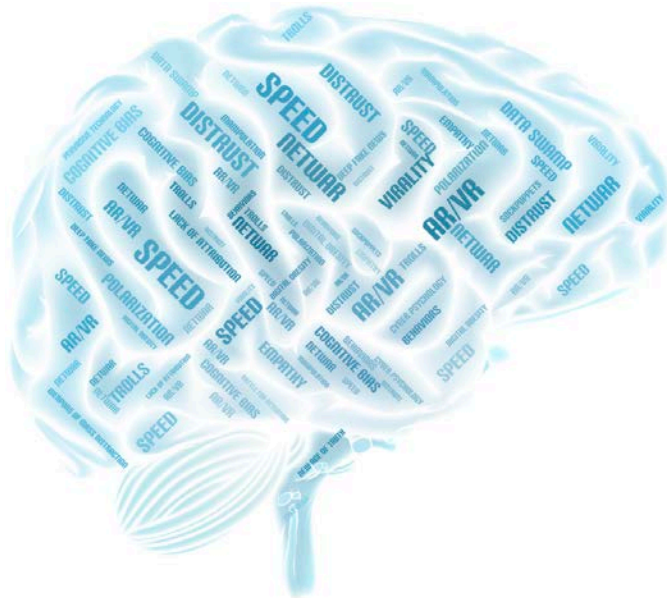




# The centrality of the brain

“The brain is the HQ of the Human body and precisely attacking the HQ is one of the most effective strategies for determining victory or defeat on the battlefield”

*Pr. Hai Jin, Li-Jun Hou, and Zheng-Guo Wang  
Chinese Journal of Traumatology, May 2018*



Nanotechnologies  
Biotechnologies  
Infotechnologies  
Cognotechnologies

*NBIC technologies tetrahedron  
Roco and Bainbridge (2012) report*

# Chinese MBS classification of brain functions



<b>Understanding the brain</b>	Understand the risk factors of brain injury caused by military activities
<b>Protecting the brain</b>	Targeted prevention of the brain damage caused by military activities
<b>Monitoring the brain</b>	Monitoring brain function through new technologies and equipment
<b>Injuring the brain</b>	Promoting the research and development of sound, light, explosion, magnetic and other new types of weapons
<b>Interfering with the brain</b>	Causing brain dysfunction and a loss of control with “smokeless” methods
<b>Repairing the brain</b>	Achieving brain function reconstruction with advanced novel medical technology
<b>Enhancing the brain</b>	Improving the level of the brain function of personnel who carry out special tasks
<b>Simulating the brain</b>	Brain-inspired robot intelligence and predicting human decisions
<b>Arming the brain</b>	Studying the arming of the brain, with brain and machine interfaces as the focus

# Government Programs



BRAIN Initiative  
2014  
\$110 million/year



China Brain Project  
2016  
\$157 million (est.)



Human Brain Project  
2016  
\$88 million/year



Japanese  
Brain/MINDS  
2014  
40 billion Yen



Australian Brain Initiative  
2016  
\$100 million/year



Korean Brain  
Initiative  
2016

The global neuro-bio economy

US\$38.9 billion in 2027

US\$27.6 billion in 2018

## Private actors



2045 Initiative



SIEMENS  
Healthineers

icometrix





## A new Domain of Operations ?

*“...the Human Domain is the one defining us as individuals and structuring our societies. It has its own specific complexity compared to other domains, because of the large number of sciences it's based upon (...) and these are those our adversaries are focusing on to identify our centres of gravity, our vulnerabilities.”*



*Herve Le Guyader- August Cole  
NATO 6<sup>th</sup> Domain of Operations*



# Conclusion

- NATO is late in responding to the CW challenges
- Building a common understanding of CW is key
- A very sensitive topic
- Ethical and legal aspects
- A multi-disciplinary approach is required