



GEORGETOWN UNIVERSITY



INSTITUTE FOR BIODEFENSE RESEARCH

# **Neural Approaches to Performance Optimization... ...and the Need for Performance Optimization of Neuroethical Approaches**

**James Giordano PhD**

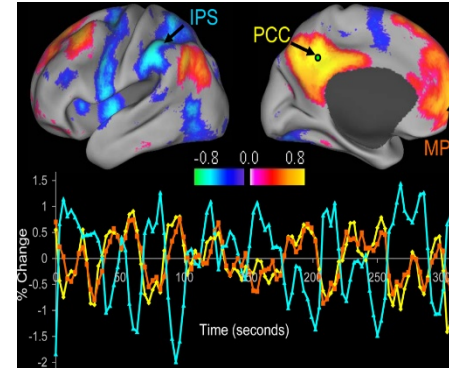
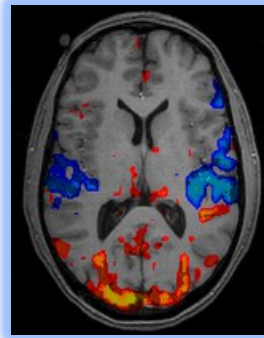
**Diane DiEuliis PhD**

**John R. Shook PhD**

# Neuroscience and Technologies (NeuroS/T)

- Assessment

- Biomarkers
- Genetics/genomics
- Imaging
- Brain modeling/mapping

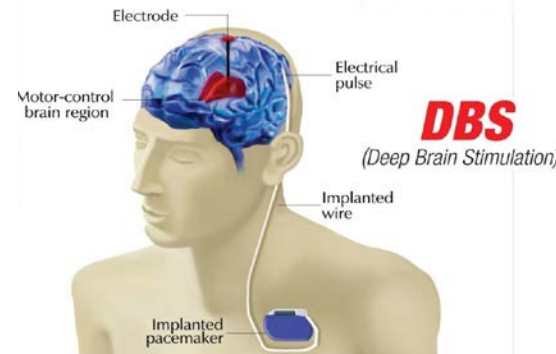
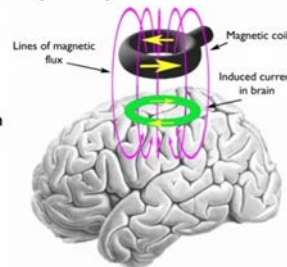


- Interventional

- Technopharmaceutics
- P-Stim
- Neurofeedback
- Transcranial Modulation
- Deep Brain Stimulation
- BCI
- Neuroprosthetics

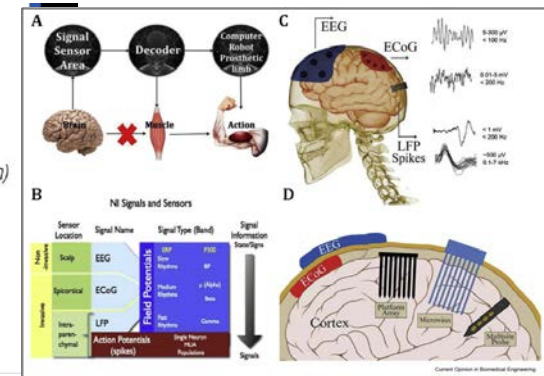
### Transcranial Magnetic Stimulation (TMS)

- Based on Faraday Principle
- Rapidly fluxing magnetic field
- Induces current in underlying cortex
- Noninvasive
- Permits focal manipulation of cortical activity



- Derivative

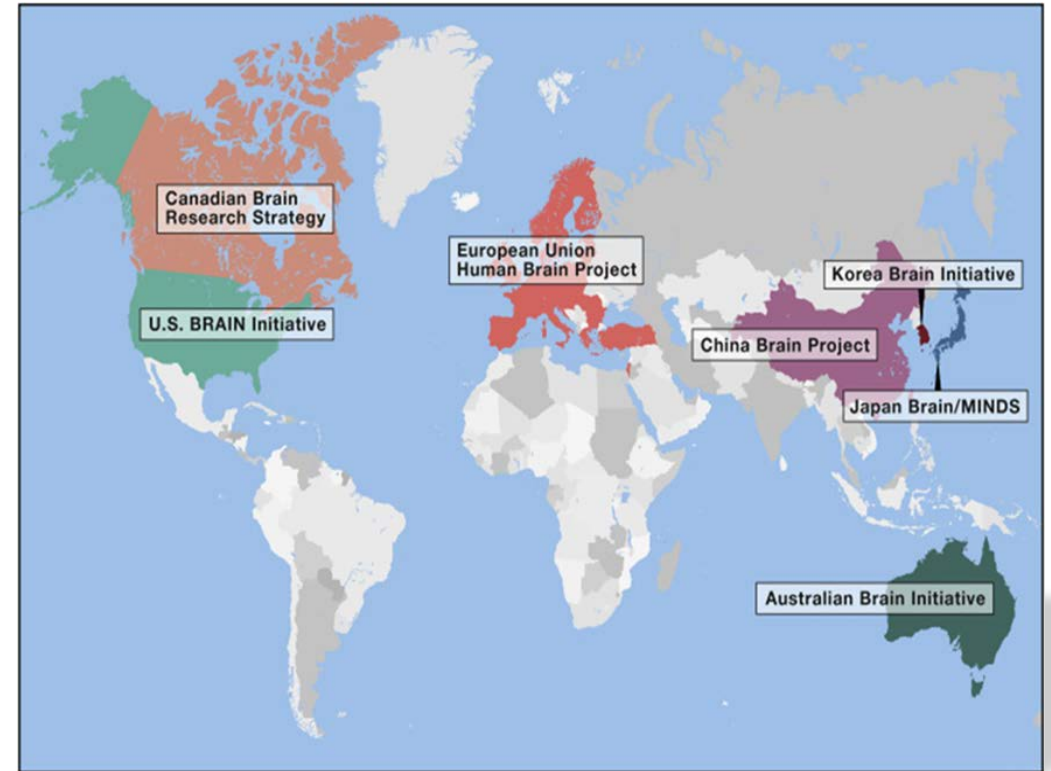
- Big Data
- AI technologies



**A-3: Actual Ability to Assess...Access...Affect**  
**To What Effect(s) and Ends?**

# Neuroscience and Technology on the 21<sup>st</sup> Century Global Stage

- Increasingly Multi-national
- Increasing Asian Effort(s)
- Advancing Developed Nations
- Capabilizing Developing Nations
- Establishing Bio-psychosocio-economic
  - Leveraging
  - Hegemonies
- Creating Contingencies in Non-Developed Nations



Considerations of *Bio-Power & Bio-Politics*





# Preparedness

**Preparation ≠ Prevention (of Relative Promise of Positive Outcomes)**

**Readiness Stance/Posture: Focused, Flexible, and Fast Moving/Adapting**

**Recognition and Responsiveness to *Both* Idiosyncratic and Systemic**

**Benefit(s)**

**Burden(s)**

**Risk(s)**

**Threat(s)**

**Harm(s)**



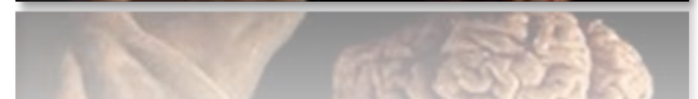
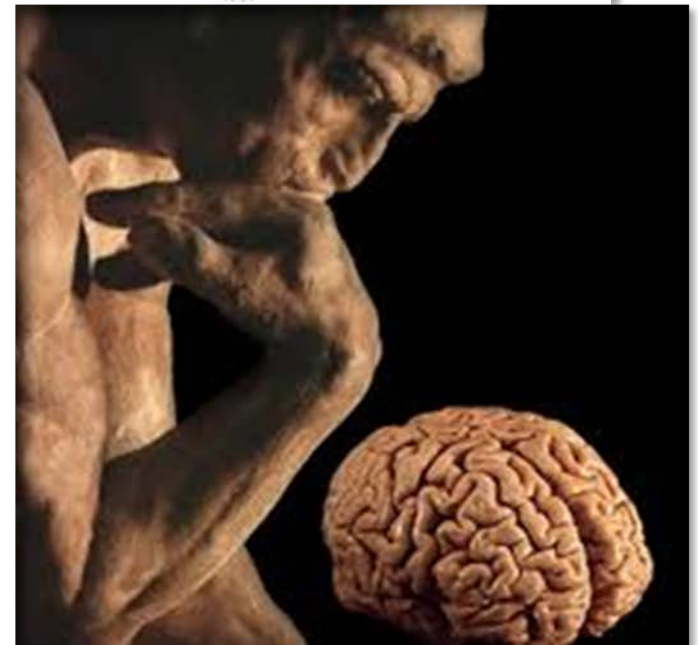
# Neuroethico-legal Issues & Risks

## Technology-focal

Intersecting unknowns  
Capabilities, limitations  
Validity, viability of use  
Runaway and Wexelblatt effects

## Social

Inviolability of “mind”/“cognitive liberty”  
*“Reading minds”*  
Autonomy: *“Mind control”*  
Awareness, understanding, consent  
Treatment/protection/enhancement  
Justice: Provision/access  
Informed Consent  
Dual-use



# Neuroethics on World Stage

- **Cosmopolitan Cognizant**
- **Community Capable**
- **Accommodating pluralist**
  - Needs
  - Values
  - Norms
  - Mores
- **Affected by/Affecting:**
  - Economics
  - Politics
  - Power Balances

*Ethics in Biology, Engineering & Medicine - An International Journal*, 4(3): 211–229 (2013)

## **Advancing Neuroscience on the 21<sup>st</sup>- Century World Stage: The Need for and a Proposed Structure of an Internationally Relevant Neuroethics**

Elisabetta Lanzilao<sup>1</sup>, John R. Shook<sup>2</sup>, Roland Benedikter<sup>3</sup>,  
& James Giordano<sup>1,4,5,\*</sup>

Shook and Giordano *Philosophy, Ethics, and Humanities in Medicine* 2014, **9**:1  
<http://www.peh-med.com/content/9/1/1>



**EDITORIAL**

**Open Access**

## **A principled and cosmopolitan neuroethics: considerations for international relevance**

John R Shook<sup>1</sup> and James Giordano<sup>2,3\*</sup>

# ON-RAMP

*Operational Neuroethical Risk Assessment and Mitigation  
Paradigm* (from Giordano, 2015; 2018 ©)

## 6-R Approach

- *Responsibility*
- *Realistic Assessment*: of the neurotechnology
- *Research*: evaluating use/effects-in-practice
- *Responsiveness*: to burdens and deleterious effects
- *Revisions*: in technology and marketing
- *Regulation*: insure rigor in development and claims

Poses key questions

Framed within defined parameters



# Particularity of “Collective Efforts”

Requires:

1. Defining Context(s)

2. Setting Ethical Goal(s)/Ideal(s)

e.g.- Rescherian Framework:

Prescriptive

Conclusive

Projective

3. Habermas’ Discursive Approach

...establish ethical sets and goals by examining presuppositions of discourse

Possible Method(s):

**Thagard Equilibrium**

(Identifying a domain of practices, identifying candidate norms for the practices, identifying the appropriate goals of the practices, evaluating the extent to which different practices accomplish these goals, and adopting as domain norms the practices that best accomplish these goals)

**Maximin Attempt** (Maximizing possible gain while minimizing loss; conferring benefit to the least-advantaged)

**Consensus Parameters**

# Quo Vadis?

- Neurobioeconomic Savvy
- Biosecurity-by-Design
- Globally Relevant & Responsive Neuroethics

 **Date** \_\_\_\_\_ 91-548/1221

\_\_\_\_\_ **needs a** \_\_\_\_\_ **REALITY CHECK**  
(tiny, medium-sized, serious)

**I think you know why, but I'll still write it out for you:**

\_\_\_\_\_ trying to knock some ☪ into you

Ⓜ 22 105 278 Ⓜ 672430 1068 Ⓜ 2400 Ⓜ **SIGNED:** \_\_\_\_\_

**Bottom line: What's most needed here is some**  **perspective**  **humility**  **gratitude**

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# Additional Information

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- Giordano J. A preparatory neuroethical approach to assessing developments in neurotechnology. *AMA J Ethics* 17(1): 56-61 (2015).

# Contact

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