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**14. ABSTRACT**
In light of ongoing progress in both neuroscience and neurotechnology, it is critical to address, explicate and examine the ethical, legal and social issues that arise in, and from such research and applications if we are to assert and maintain 1) ongoing moral integrity both domestically and on the global stage, and 2) advance these fields in national security, defense and intelligence so as to ensure against their corruption and frank misuse – both domestically and by other nations and/or groups.

Toward these ends, the proposed conference (NELSI-3) will conjoin a group of recognized scholars to engage a discursive and dialectical approach to these issues as particularly suited to an invited audience of concerned and influential representatives from the governmental, S/T, research, development, testing and evaluation (RDTE), public and media communities.

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| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | Dr. Kenneth DeJong |
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**Conference Report:**
**Third National Neuroscience: Ethical, Legal and Social Issues (NELSI-3) conference – *Ethical Issues in the Use of Neuroscience and Neurotechnology in National Defense***

**Supported through ONR Grant N00014-10-1-0887**

The 2011 third National Neuroscience: Ethical, Legal and Social Issues (NELSI-3) conference – *Ethical Issues in the Use of Neuroscience and Neurotechnology in National Defense* - was developed and implemented as a working collaboration between the Center for Neurotechnology Studies of the Potomac Institute for Policy studies (CNS/PIPS), Arlington VA, USA (a 501.c-3, non-profit organization) and the Krasnow Institute for Advanced Studies of George Mason University, Fairfax VA, USA; with the support of a grant from the Office of Naval Research (Grant N00014-10-1-0887: co-principal investigators, Drs. James Olds and Kenneth DeJong of Krasnow Institute, GMU, with the consulting collaboration of Dr. James Giordano, CNS/PIPS).

**Focus, and aims accomplished:**

The conference was held on 25. February, 2011 at the Mason Inn of George Mason University, Fairfax, VA, USA, and specifically focused upon three (3) core issues:
(1) Identifying and analyzing extant gaps in neuroscience, neurotechnology and the knowledge these disciplines afford, as relevant to ethical, legal and social issues in their use in national security, intelligence and defense.

(2) Explication of specific neuroethical, legal and social issues arising in, and from neuroscience and neurotechnology in national security, intelligence and defense

(3) Explication and discussion of possible strategies, tactics and processes toward preventing and resolving ethical, legal and social issues generated by the use and/or misuse of neuroscience and neurotechnology in national defense and security.

Particular emphasis was placed upon addressing, explication and examining the ethical, legal and social issues that arise in, and from such research and applications if we are to assert and maintain 1) ongoing moral integrity both domestically and on the global stage, and 2) a realistic consideration of advancing these fields in national defense, security, and intelligence so as to ensure against their purloinment, corruption and frank misuse – both domestically and by other nations and/or groups.

Toward these ends, the conference convened nine (9) scholars – all well known and regarded for their work in this field. The conference was chaired by Prof. James Giordano PhD (CNS/PIPS), who served to provide a thematic introduction, and ground each speaker's lecture to the core issues of the conference. As well, Prof. Giordano provided a focal lecture on the need for neuroscience and neurotechnology in national security and defense, and a putative neuroethical approach to the issues and problems generated by such use of neuroscience (see below for detailed description).

**Presenters and topics:**

General introduction to the conference was provided by:

**Prof. James Olds PhD,** Director and CEO of the Krasnow Institute for Advanced Study of George Mason University in Fairfax Virginia, and Shelley Krasnow University Professor of Neuroscience and Chair of the Department of Molecular Neuroscience. Prof Olds has an additional academic faculty appointment at the Department of Anatomy and Cell Biology at the Uniformed Services University of the Health Sciences in Bethesda Maryland.

Subsequent speakers addressed the following topics and issues:

**James Canton PhD**, CEO and Chairman of the Institute for Global Futures, CA;
*Towards the Neuro-Future: Challenges and Opportunities*
Dr. Canton provided a forecast that neuroscience will impact civilization in ways that are transformative, and in this way, a "neuro-centric future" is fast approaching. As with any powerful new technological tool, neuroscience will confer the capacity to incur potentially great good, as well as potentially great risk, of which we should all be aware. Dr. Canton posed the question of whether we are/will be prepared for the accelerated and exponential growth of neuroscience and its technologies that the current state of the field portends. He opined that examining future neuro-future scenarios is prudent to raise situational awareness, especially for national security. It is possible that "neuro-wars" will occur - fought by powers beyond the traditional borders of territory or geography, and engaged by cognitive assets and entities over a landscape of virtual spaces where there is only consciousness. But today, and in the more proximate future, it is likely that neuroscience and technology will transform as well the paradigms of national security, intelligence and defense, and will shape both the tools and the rules that such activities entail. Dr. Canton summarized by posing tentative approaches to meeting the challenges of neuroscientific and technological momentum and its impact on national security.

**Prof. James Tabery, PhD,** Assistant Professor of Philosophy and a member of the Division of Medical Ethics and Humanities at the University of Utah, UT..
*Can (and Should) We Regulate Neurosecurity? Lessons from the History of Science, the Military, and Regulation*
Prof. Tabery offered an historical overview of the relationship of scientific research and the military. He argued that there is thus reason to expect this relationship to incorporate the neurosciences as well, in the form of neuropharmacology, neural imaging, and neural engineering. Claiming that it is an oversimplification to judge these developments in neurosecurity as either always bad or always good; cases must be judged on a much finer level, and so neuroethicists have called for regulatory/oversight bodies to monitor developments in neurosecurity. Prof. Tabery posed that the history of research oversight bodies affords a resource from which to draw and judge the suitability of such a neurosecurity regulatory body: conflicts of interest committees, institutional review boards, and institutional animal care and use committees. He concluded with a survey of the history of the science-military relationship as well as the

history of research oversight efforts in order to assess the promises and perils of a neurosecurity regulatory body.

**Prof. Jonathan Moreno, PhD,** David and Lyn Silfen University Professor of Ethics, and Professor of Medical Ethics and of History and Sociology of Science at University of Pennsylvania, PA.
*Mind Wars: Brain Research and National Defense*
Prof. Moreno claimed that although the bioethics literature on national security issues is surprisingly spares, the implications of neuroscience for national security are of increasing public and scholarly interest. He posed that evidence for this assertion is limited but compelling; one important source of evidence being found in reports by U.S. government advisory committees over the past several years. Prof. Moreno elucidated the paucity of precise metrics of national security research and development. At least some of this work takes place under classified conditions, including "black" or unpublished budgets, but even more pertinent is the fact that R&D is not always clearly identified according to budget lines. Therefore standard trend analysis in terms of agency mission or dollar investment is not available. There are also familiar problems in defining precisely what kind of work falls under the ambit of neuroscience. Prof. Moreno concluded by asserting that the growing interest in neuroscience on the part of national security agencies can be discerned in part by reviewing recent reports from the U.S. National Academies.

**Prof. Jonathan H. Marks, MA, BCL (OXON.),** Associate Professor of Bioethics, Humanities and Law at the Pennsylvania State University, and Director of the Bioethics and Medical Humanities Program on the main campus at University Park, PA.
*Hazards of Translation and Transformation: A Critique of Neuroscience in National Security from Science Studies, Ethics and Human Rights*
Prof. Marks' presentation explored some of the ways in which neuroscience is transforming (and has the potential to transform) the national security enterprise. These transformations (actual and potential) have triggered a variety of concerns. Human rights scholars and organizations are anxious about the impact of neuroscience and neurotechnologies on the human rights of soldiers and detainees. Ethicists worry about the ethical implications of neuroscience especially when applied to vulnerable populations. Some military and intelligence personnel are concerned about internal distortions, fearing that neuroscience will alter the priorities in their field just as – some argue – signals intelligence led to the de-prioritization of human intelligence. This presentation posed that each of these communities has legitimate cause for concern, and drew upon science studies scholarship to explore some common factors that illuminate and/or untie these different expressions of concern. In conclusion, Prof. Marks called for a renewed discussion of the hazards at the intersections of neuroscience in national security – in conferences that are like this one open to the public, and in large public fora.

**Lt. Col. William Casebeer, PhD,** (at that time) Lieutenant Colonel, US Air Force. Currently, Program Manager, Defense Advanced Research Projects Agency (DARPA).
*Neuroethics and National Security: The Promise and Peril of Neuroscience Technology, With a Hopeful Coda*
Dr. Casebeer stated that given the stakes, issues at the intersections of neuroscience and national security are rightly freighted with ethical, legal and social concerns. He argued that the use of neuroscience to tutor methods of influence in warfare however,

can be morally praiseworthy, especially if it aids in development of technologies which can make warfare more humane or less likely. Given that we already influence each other's neurobiological states daily via conversation and action, exploring the interactions of environments and neural mechanisms in a responsible manner can open new pathways to prevent of loss of autonomy. Dr. Casebeer concluded that morality (be it virtue-theoretic, rights-oriented, or consequential in nature) may demand that we apply what we know about brains to questions of influence so as to forestall the use of brawn to resolve disputes between political communities.

**Chris Forsythe, PhD,** Distinguished Member of Technical Staff for the Cognitive Science and Applications Department, Sandia National Laboratories in Albuquerque, NM.

*The Human Dimension and U.S. National Security: Our Current Challenge, but Greatest Opportunity*

Dr. Forsythe claimed that advances in brain science will only accelerate, and it is probable that major breakthroughs relevant to national security are both viable and imminently achievable. He noted that there exists a recurrent cycle in which problems emerge within the national security domain and the first, knee -jerk response is to seek technology solutions. Then, after substantial investment, and often losses, it is realized that there exists a significant human dimension. Forsythe argued that advances in brain science, combined with related progress in the behavioral sciences, inter woven with technological advances, provide a basis for breaking this cycle and converting the human dimension from a problem to be solved to a basis for an advantage achieved through enhanced human capabilities to more quickly and appropriately interpret events, reach better decisions and more effectively carry out action.

**Prof. John Shook, PhD,** Director of Education and Senior Research Fellow of the Center for Inquiry, and Visiting Assistant Professor of Science Education at the University at Buffalo,NY.

*The Neuroethical Classification of Modifications to Body and Self*

Prof. Shook opined that neuroethics, unlike bioethics, cannot afford to develop its methodology within a domestic legal framework and culturally stable conceptions of moral agency and personhood. He argued that neuroethics requires an ultimately pragmatic assessment of the possible and actual uses of neuroscience and neurotechnology made by any country or group around the world, especially when establishing an ethical posture toward neuroscientific research by and for national defense. Prof. Shook concluded by stating that a new typology is accordingly required to practically deal with these kinds of radical possibilities and questions, because the issues that can and will arise in the neuroethics of national conduct and security on the world-stage may be far more radical and ethically provocative and we must be prepared to correctly identify them and to subject any research and application to special ethical deliberation.

**Prof. James Giordano, PhD,** Director of the Center for Neurotechnology Studies at the Potomac Institute for Policy Studies, Arlington, VA, and Senior Research Associate of the Oxford Centre of Neuroethics, University of Oxford, UK.

*Neuroscience and Technology in National Security: Toward a Stance of Preparedness and Neuroethics of Prudent Action*

Prof. Giordano asserted that neuroscience and neurotechonolgy (NeuroS/T) can and will continue to be employed in the military, and other national defense/security applications. Noting that such employment raises serious concerns about 1) the uses and misuses of these techniques and technologies, and 2) the level of transparency

maintained by government research laboratories, if not overall initiatives, he argued that these concerns are valid and must be addressed and responded to, but must be considered within the realities of how science and technology have been, and are used in leveraging geo-political power. This mandates commitment to NeuroS/T as critical to national security agenda, as failure to do so could lead to distinct vulnerabilities both in the United States' capability in these areas, and its population (and those of its allies). Prof. Giordano concluded by stating that governmentally-conducted activities of NeuroS/T must engage an often difficult – but nevertheless essential – balance of moral integrity and practical effectiveness, and lack of transparency in the name of national security dictates careful oversight, governance and control of science and technology so as to ensure that the moral and socio-legal aspects of any such work be analyzed, and addressed in the light of public concerns.

A 90 minute panel discussion followed the individual presentations; the panel featured all speakers and engaged the audience in an open-forum question/answer session.

**Schedule:**

The overall schedule of the day-long conference is presented below:

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| 8-8:30 am | Coffee | |
| 8:30 am | Welcome | Prof. James Olds, PhD |
| 8:45 am | Introduction | Prof. James Giordano, PhD |
| 9:00-9:30 am | Opening Plenary<br>Towards the Neuro-Future: Challenges and Opportunities | James Canton, PhD |
| 9:30-10 am | Can (and Should) We Regulate Neurosecurity?: Lessons from the History of Science, the Military, and Regulation | Prof. James Tabery, PhD |
| 10-10:30 am | Morning Break | |
| 10:30-11 am | Mind Wars: Brain Research and National Defense | Prof. Jonathan Moreno, PhD |
| 11-11:30 am | Hazards of Translation and Transformation: A Critique of Neuroscience in National Security from Science Studies, Ethics and Human Rights | Prof. Jonathan H. Marks, MA, BCL (Oxon.) |
| 11:30-12 am | Neuroethics and National Security: The Promise and Peril of Neuroscience Technology, With a Hopeful Coda | LtCol William Casebeer, PhD |
| 12-1:30 pm | Lunch | |
| 1:30-2 pm | The Human Dimension and U.S. National Security: Our Current Challenge, But Greatest Opportunity | Chris Forsythe, PhD |

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| 2-2:30 pm | The Neuroethical Classification of Modifications to Body and Self | Prof. John Shook, PhD |
| 2:30-3 pm | Neuroscience and Technology in National Security: Toward a Stance of Preparedness and Neuroethics of Prudent Action | Prof. James Giordano, PhD |
| 3-3:30 pm | Break | |
| 3:30-4:45 pm | Panel Discussion and Open Q/A | All Speakers |
| 5-6:30 pm | Reception at:<br>Krasnow Institute for Advanced Studies<br>George Mason University | |

The reception was funded, in total, by the Center for Neurotechnology Studies of the Potomac Institute for Policy Studies, Arlington, VA, and by NeuroBioEthics.org.

The conference was attended by 61 participants, including representatives from government laboratories, the armed forces, and the press.

**Evidentiary Products/Outcomes:**

1. Video.
The conference was professionally videotaped by Michael Kinney. The video of the conference is available for viewing at both the NELSI website, www.nelsi3.com, and on the website of the Potomac Institute for policy Studies (www.potomacinistitue.org). As well, a DVD of the conference can be provided, upon request.

2. Book volume.
Presenters' lectures are being formalized into chapters for a book volume, tentatively entitled *Neuroscience and Neurotechnology in National Security and Defense: Practical Capabilities, Ethical Considerations*, to be edited by Prof. James Giordano, and published by the Potomac Institute Press. This volume will acknowledge the support of the US Navy and Office of Naval research, and a complimentary copy shall be provided upon completion (estimated, spring/summer 2012).

3. Subsequent events.
The topic and theme represent the focus of ongoing work of Prof. James Giordano and the Center for Neurotechnology Studies, PIPS. Subsequent conferences at CNS/PIPS (e.g.- *Neuro-cognitive Science and Technology in National Defense: Assessing and Manipulating Brain, Mind and Social Action* – 18.August, 2011; *The Use and Misuse of Neuro-psychiatry in Predicting and Preventing Social Violence* – 9. September 2011) have been spawned through the initial NELSI-3 conference, and a special session of the 2011 International Neuroethics' Society Meeting (11. November 2011) will be explicitly dedicated to the topic of *Transparency in Defense-based Neuroscientific*

*Research – Ethical Issues and Realities,* and will feature three(3) of the NELSI-3 speakers, Drs. William Casebeer, James Giordano and Jonathan Moreno, in discourse.

**Summary:**

In sum, the conference was well-attended, and presented a thorough view of the topic. Neuroscience and neurotechnology will continue to be used in service of national defense and security – and this is vital if the United States and its allies are to maintain scientific and technical competence on a par with other nations (e.g.- China, India, Russia, Brazil) that are rapidly gaining resources, capabilities and leveraging power in frontier areas of bioscience and biotechnology, including neuroscience. This conference provided important insights to the field, and was contributory to the ongoing work – by our groups and others - in this area as key to national security, intelligence and defense.

**Respectfully submitted, and point of contact:**

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