



The Cebrowski Institute

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Mission

Incubate innovations for conducting military affairs in the age of digital technologies



“Information” and “Innovation”
are our middle names



Keys to Incubation Success

- Surfing for Emergences
- Interdisciplinary Networks
- Serendipity
- Design
- Innovation



Incubations

- Energy
- Cross Sector Operations
- Civil-Military Affairs
- JIEDDO
- VIRT
- Technology Transfer
- Natural Language Processing
- World Wide Consortium for the Grid
- STEM internships
- Cyber Adventurers
- Hastily Formed Networks
- Mobile devices
- Mobile Wireless Comms
- Navy Tactical Cloud
- Information Dominance
- Design Thinking
- Innovation Adoption
- Data Science
- Next Generation Leaders
- Climate Change
- Big Ideas



Energy

- Sue Higgins (IS), Mitzi Wertheim, started 2005
- Helping USN significantly reduce energy footprint
- Adoption focus: technology, policy, culture
- Seeded by energy web community development and speakers – e.g., Amory Lovins (now on staff as PoP)
- Facilitated “The Energy Conversation” 2008 in DC (Mitzi Wertheim, an early advisor to institute, now on staff as PoP)
- Van Bibber attended 1st Navy Energy Summit at ONR and got NPS involved, leading to EAG today
- Led design & development of Navy Executive Ed (now in CEE)
- Designing Navy-wide energy culture change initiatives



Cross Sector Operations

- Scot Miller (IS) started 2007
 - Helped USN & DoD design coordination and collaboration as Navy increasingly engages in multi-agency, multi-partner operations
 - Example: DoD Directive 3000.05 (2009) delineates DoD support of Stability, Security, Transition and Reconstruction (SSTR)
 - Includes Phase 0 (pre-conflict) work
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Civil-Military Affairs

- Karen Guttieri (GSBPP), started 2008
 - Helped USN/DOD think through public policy and civil-military issues in military ops
 - Developed early multi-disciplinary course; now Masters curriculum for Civil Affairs community
 - Now part of GSBPP; Guttieri recently received award from Civil Affairs community
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JIEDDO

- COL Andy Hernandez USA, (OR), started in 2009
 - Detecting and destroying IEDs and the networks that built them
 - Launched an interdisciplinary cross campus IED study initiative
 - Transitioned into National Security Institute until the initiative was complete
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Valued Information at the Right Time (VIRT)

- Rick Hayes-Roth (IS), started 2008
- Reducing cognitive overload from information glut associated with big data
- Dan Boger continues the project in IS Dept: the concern is growing
- Initial sponsor USMC, now Intel Community



Technology Transfer

- Peter Denning (CS), started in 2011
- Helped DARPA evaluate its effectiveness at transferring its new technology to military customers
- Nick Dew, Dan Nussbaum, and students from CS, IS, OR, GSBPP
- DARPA had 30% success rate (industry 4%)
- GSBPP faculty continue technology transfer research with other sponsors



Natural Language Processing

- Craig Martell (CS), started 2007
- Identifying authors and intentions from captured chat texts
- Big issue in data mining
- Detect terror networks from chat
- Measure learning in MOOCs



World Wide Consortium for the Grid (W2COG)

- Chris Gunderson (IS), started 2006
- Confederation of DOD units to promote working standards and test ranges for the next generation of defense Internets
- Cooperation with NCOIC, Network Centric Operations Industry Consortium, with similar aims for defense contractors
- Transitioned to W2COG.ORG, a 501(c)(3)
- Network Centric Operations topic continues in several NPS departments



STEM Internships

- Alison Kerr (CI), started 2005
 - Launched summer intern program with Hartnell CC Salinas, Hispanic students, 1st generation Americans
 - Navy encourages outreach to develop young people who might later engage with Navy
 - Wide participation across campus
 - Grew from 2 interns (2005) to > 100 (2013)
 - Top Navy STEM Intern Lab
 - Transition to DOR in 2013
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Cyber Adventurers

- Off shoot of STEM -- Peter Denning and Sue Higgins – assisted by 2 NSF grants 2006 and 2009
- Excite K-12 students about CS, addressing Navy CS & STEM concerns
 - After school and summer programs
 - Mentors: CSUMB undergrads, high school students
 - Cyber security games – Peterson and Gondree
- Became part of mission of Military Cyber Professionals Association (MAJ Joe Billingsley, USA)
- Transitioned to NPS Cyber Club and local non-profit, Lyceum
- NPS students starting to grow Cyber Adventurer models at follow-on duty stations



Hastily Formed Networks (HFN)

- Brian Steckler (IS), started 2004
- Suitcase Internet comms for HA/DR
- HA/DR now a Navy strategic objective
- Student teams to Tsunami, Katrina, Haiti, Philippines, CA wildfires, and exercises
- Visible “trademark” of NPS
- Ongoing Cebrowski Institute project



Mobile Devices

- Gurminder Singh (CS), started 2004
- Move important computations from mainframes and desktops to portable devices
- Grown from early curiosity to major theme today
- Partnership with CORE lab
- Ongoing Cebrowski Institute project



Mobile Wireless Communications

- Geoffrey Xie (CS), started 2010
- Initiated by student Capt Josh Dixon (USMC) who had dual major CS-Business
- Make MWC a seamless part of USMC & Army field ops
- CS, IS, SE, DA, ECE, GSBPP, TRADOC
- Ongoing Cebrowski Institute project



Navy Tactical Cloud

- Warren Yu (CI), started 2011
 - Helping Navy transition to cloud services and cloud operations
 - Grew strong partnership with Fleet Numerical Meteorology & Oceanography Command (FNMOC), Monterey, Navy's largest supercomputing faculty
 - Involvement by faculty in IS, CS, OR, DA, ITACS
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Information Dominance

- N2/N6 OPNAV studies, started 2013
 - Partner with NPS Information Dominance Center for Excellence (IDCFE, CAPT Tim Unrein, USN) to spur faculty participation in N2/N6 part of OPNAV studies program
 - Over 100 faculty proposals in the first round
 - Ongoing Cebrowski Institute collaboration
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Design Thinking

- Nancy Roberts and John Arquilla (DA), 2012
- Developed first NPS design studio in CI, modeled after Silicon Valley IDEO and Stanford D-Center
- Especially useful for finding solutions to wicked problems
- Initial project: Army 2020 (GEN Odierno)
- Design approach increasing in classes and projects across campus
- Ongoing Cebrowski Institute collaboration



Innovation Adoption

- Peter Denning (CS) and Nick Dew (GSBPP), 2009
 - Adoption is the real challenge of innovation – design is the “easy” part
 - Big challenge in Navy to overcome bureaucratic inertia and maintain leadership in use of technologies
 - E-week workshops “innovation by design” since 2009
 - Ongoing Cebrowski Institute project
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Data Science

- Emerging wave, 2013
 - The science behind big data
 - Driven by accelerating trend of digitization of almost everything
 - Generate, collect, search, analyze, mine exabytes of data
 - Navy must master this digital world for operational superiority
 - Cooperation of data analysts, system architects, and application specialists
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Climate Change

- Emerging Wave, 2014
- Increasingly impacting military affairs
 - Arctic ice melt
 - Sea level rise, land loss
 - Extreme weather events
 - Droughts leading to famine leading to migrations of refugees
 - Spread of infectious disease
 - energy



Next Generation Leaders

- Emerging wave, 2014
 - Grow senior officers capable of thinking strategically in the world that will exist in 20 or more years
 - Digital technologies everywhere
 - Most operations are digital
 - Adversaries operate by swarming in small networks hidden in Internet
 - Full of uncertainties, surprises, disruptions
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Big Ideas

- Helping Navy leadership think and position for what is coming
 - Surfing emerging waves of technologies and possibilities, in search of new ideas that may change the world and military operations
 - Avoiding technology surprises
 - Setting future education requirements
 - Positioning for emerging technologies
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