Rethinking Electronic Warfare

Single large jammer
Carpet jamming
One radar type at a time
Vulnerable monolithic source
Major upgrade to increase standoff

Multiple coordinated micro jammers
Precision jamming
Jam multiple radar types
Non-attributable sources, graceful degradation
Increase standoff by adding units
Rethinking Space

Small, scalable satellites
Construct on orbit
Repair and service

Launch from anywhere on 24 hour call-up
$1M for 100 lbs to orbit
$5M for 3,000 lbs to orbit

Space Domain Awareness
Cyber Grand Challenge

*Bring about an automation revolution in computer security*

- Using the competition format which measures analyst cyber reasoning ability...
- A Grand Challenge for *automated defenders*
- Systems that can detect and repel novel threats from networks
Memex: Domain-Specific Deep Web Search
Example: Investigating Human Trafficking Networks

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## Memex

**Highly Linked Phone Numbers**

<table>
<thead>
<tr>
<th>Offense</th>
<th>Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>2</td>
</tr>
<tr>
<td>Drugs</td>
<td>9</td>
</tr>
<tr>
<td>Theft</td>
<td>113</td>
</tr>
<tr>
<td>Assault</td>
<td>123</td>
</tr>
<tr>
<td>Children related</td>
<td>35</td>
</tr>
<tr>
<td>Other</td>
<td>184</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>466</strong></td>
</tr>
</tbody>
</table>

In law enforcement database

Tied to fund transfers

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ADEPT Interventions

- **Distributed diagnostics:** Molecular and analytical methods suitable for use outside hospital settings
- **Transfer of immune responses:** Nucleic acid constructs and delivery for *in vivo* production of protective antibodies that impart immediate prophylaxis or treatment
- **New vaccine platforms:** RNA-based vaccines with controlled immunogenicity able to be designed and manufactured rapidly
Neurotechnologies

Movement and Control

Memory Recovery

Behavior

Other...

Revolutionizing Prosthetics (RP)

Restorative Encoding Memory Integration Neural Device (REMIND)

Restoring Active Memory (RAM)

Systems-Based Neurotechnology for Emerging Therapy (SUBNETS)

New Investments in Emerging and Supporting Areas

Understanding Plasticity and Adaptation Processing/Data Platforms

Reorganization and Plasticity to Accelerate Injury Recovery (REPAIR)
Neuro Function, Activity, Structure, and Technology (Neuro-FAST)

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Federal R&D

- DARPA $2.9B
- NIH
- DoD S&T $11.5B
- DOE
- NSF
- NASA
- DoD Military Systems Development $52.9B
- All other

FY15 President’s Budget Request
$135B

DARPA Budget

Constant FY14 $M

FY 09 FY 10 FY 11 FY 12 FY 13 FY 14 FY 15

Then year $ $3014M $2985M $2835M $2814M $2580M $2779M $2915M
Change from FY09 -2% -9% -11% -20% -16% -13%

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