Alignment to US National Interest -2024

The following critical and emerging technology areas are of particular importance to the national security of the United States:

1. Advanced Computing
2. Advanced Engineering Materials
3. Advanced Gas Turbine Engine Technologies
4. Advanced and Networked Sensing and Signature Management
5. Advanced Manufacturing
6. Artificial Intelligence
7. Biotechnologies
8. Clean Energy Generation and Storage
9. Data Privacy, Data Security, and Cybersecurity Technologies
10. Directed Energy
11. Highly Automated, Autonomous, and Uncrewed Systems (UxS), and Robotics
12. Human-Machine Interfaces
13. Hypersonics
14. Integrated Communication and Networking Technologies
15. Positioning, Navigation, and Timing (PNT) Technologies
16. Quantum Information and Enabling Technologies
17. Semiconductors and Microelectronics
18. Space Technologies and Systems

The above high levels are being detailed in following sections. We have picked only those that we have the capability and skills to offer meaningful service in areas of products and services.

Details of above (only our focus areas)

Advanced Computing

1. Advanced supercomputing, including for AI applications
2. Edge computing and devices
3. Advanced cloud services
4. High-performance data storage and data centers
5. Advanced computing architectures
6. Advanced modeling and simulation
7. Data processing and analysis techniques
8. Spatial computing

Advanced and Networked Sensing and Signature Management

1. Payloads, sensors, and instruments
2. Sensor processing and data fusion
3. Adaptive optics
4. Remote sensing of the Earth
5. Geophysical sensing
6. Signature management
7. Detection and characterization of pathogens and of chemical, biological, radiological and

8. nuclear weapons and materials
9. Transportation-sector sensing
10. Security-sector sensing
11. Health-sector sensing
12. Energy-sector sensing
13. Manufacturing-sector sensing
14. Building-sector sensing
15. Environmental-sector sensing

Artificial Intelligence (AI)

1. Machine learning
2. Deep learning
3. Reinforcement learning
4. Sensory perception and recognition
5. AI assurance and assessment techniques
6. Foundation models
7. Generative AI systems, multimodal and large language models
8. Synthetic data approaches for training, tuning, and testing
9. Planning, reasoning, and decision making
10. Technologies for improving AI safety, trust, security, and responsible use

Data Privacy, Data Security, and Cybersecurity Technologies

1. Distributed ledger technologies
2. Digital assets
3. Digital payment technologies
4. Digital identity technologies, biometrics, and associated infrastructure
5. Communications and network security
6. Privacy-enhancing technologies
7. Technologies for data fusion and improving data interoperability, privacy, and security
8. Distributed confidential computing
9. Computing supply chain security
10. Security and privacy technologies in augmented reality/virtual reality

Highly Automated, Autonomous, and Uncrewed Systems (UxS), and Robotics

1. Surface
2. Air
3. Maritime
4. Space
5. Supporting digital infrastructure, including High Definition (HD) maps
6. Autonomous command and control

Human-Machine Interfaces

1. Augmented reality
2. Virtual reality
3. Human-machine teaming

    4. Neurotechnologies

Integrated Communication and Networking Technologies

1. Radio-frequency (RF) and mixed-signal circuits, antennas, filters, and components
2. Spectrum management and sensing technologies
3. Future generation wireless networks
4. Optical links and fiber technologies
5. Terrestrial/undersea cables
6. Satellite-based and stratospheric communications
7. Delay-tolerant networking
8. Mesh networks/infrastructure independent communication technologies
9. Software-defined networking and radios
10. Modern data exchange techniques
11. Adaptive network controls
12. Resilient and adaptive waveforms

Positioning, Navigation, and Timing (PNT) Technologies

1. Diversified PNT-enabling technologies for users and systems in airborne, space-based,
2. terrestrial, subterranean, and underwater settings
3. Interference, jamming, and spoofing detection technologies, algorithms, analytics, and
4. networked monitoring systems
5. Disruption/denial-resisting and hardening technologies

Quantum Information and Enabling Technologies

1. Quantum computing
2. Materials, isotopes, and fabrication techniques for quantum devices
3. Quantum sensing
4. Quantum communications and networking
5. Supporting systems

Semiconductors and Microelectronics

1. Design and electronic design automation tools
2. Manufacturing process technologies and manufacturing equipment
3. Beyond complementary metal-oxide-semiconductor (CMOS) technology
4. Heterogeneous integration and advanced packaging
5. Specialized/tailored hardware components for artificial intelligence, natural and hostile radiation environments, RF and optical components, high-power devices, and other critical applications
6. Novel materials for advanced microelectronics
7. Microelectromechanical systems (MEMS) and Nanoelectromechanical systems (NEMS)
8. Novel architectures for non-Von Neumann computing

Space Technologies and Systems

1. In-space servicing, assembly, and manufacturing as well as enabling technologies
2. Technology enablers for cost-effective on-demand, and reusable space launch systems
3. Technologies that enable access to and use of cislunar space and/or novel orbits

4. Sensors and data analysis tools for space-based observations
5. Space propulsion
6. Advanced space vehicle power generation
7. Novel space vehicle thermal management
8. Crewed spaceflight enablers
9. Resilient and path-diverse space communication systems, networks, and ground stations
10. Space launch, range, and safety technologies

Source: https://www.whitehouse.gov/wp-content/uploads/2024/02/Critical-and-Emerging-Technologies-List-2024-Update.pdf