

Estimation of Technology Convergence

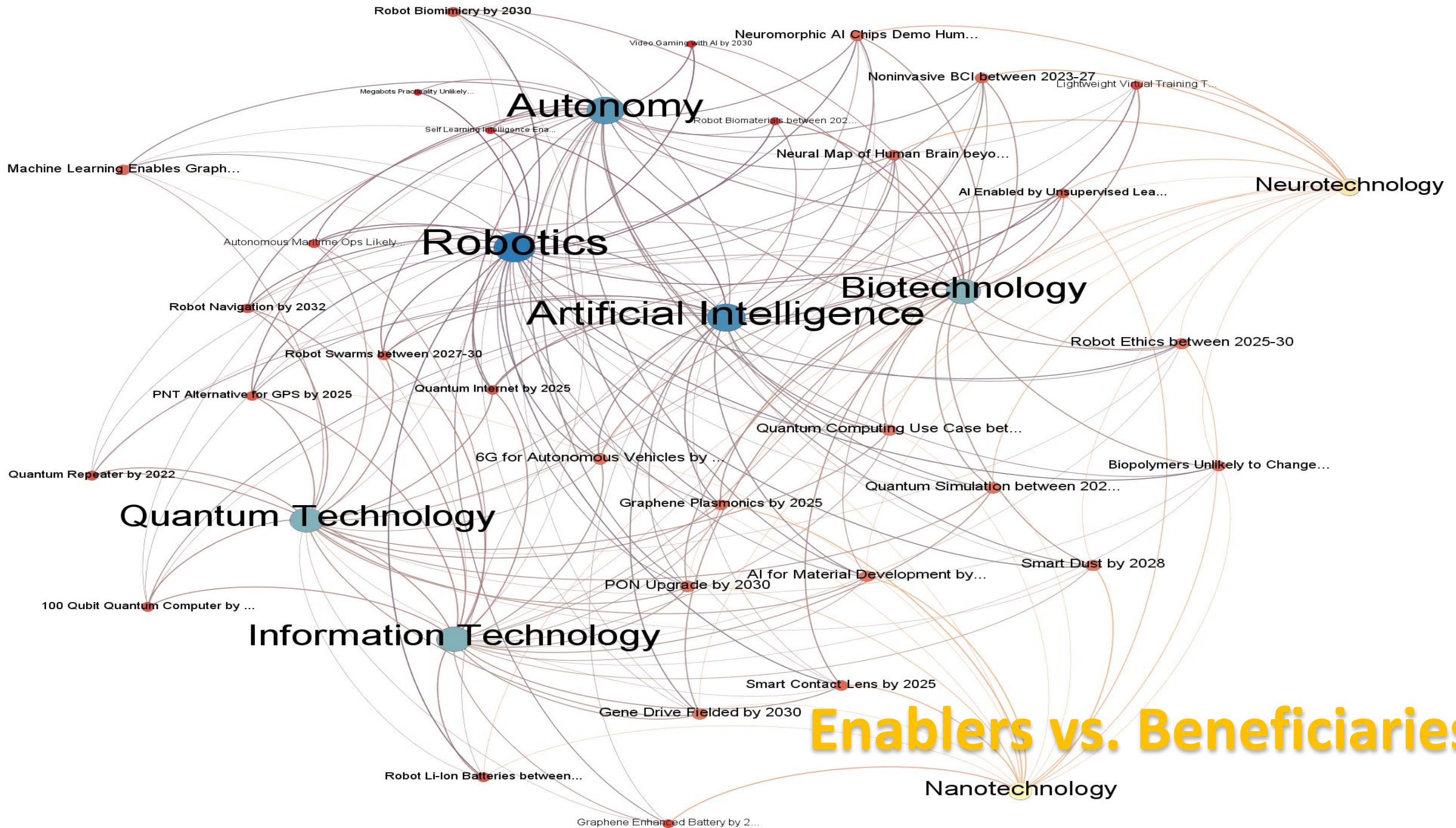
Nick Delcour, Louis Duncan,
Steve Frahm, Pat Lancaster,
Lance Vann

- Mad Scientist Fellows

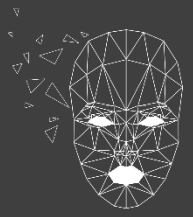


Requirement:

“How, when, and where are artificial intelligence, biotechnology, quantum technology, nanotechnology, neurotechnology, autonomous technology, robotics, and information technology likely to converge in ways relevant to the United States Army over the next 15 years?”



Enablers vs. Beneficiaries



Kesselman List of Estimative Words

Certainty 100%

Almost Certain

86-99%

Highly Likely

71-85%

Likely

56-70%

Chances a Little Better [or Less]

46-55%

Unlikely

31-45%

Highly Unlikely

16-30%

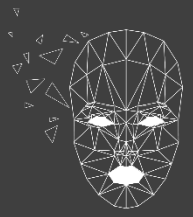
Remote

1-15%



Likelihood

Impossibility 0%



TECHNOLOGY
CONVERGENCE 2035

Convergence #1

HIGHLY LIKELY:

Decentralized AI Management of
Networks

2035

Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

Bio-
Technology

Autonomous
Technology

Robotics

Quantum Internet with Robust PON Architecture



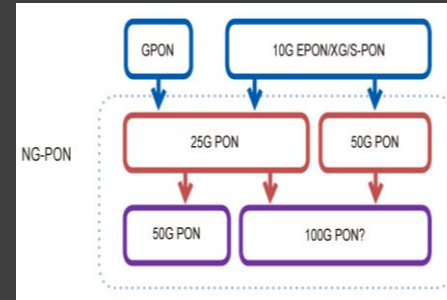
Quantum Internet



Quantum
Nanotech
IT

IT

Passive Optic Networks (PON)

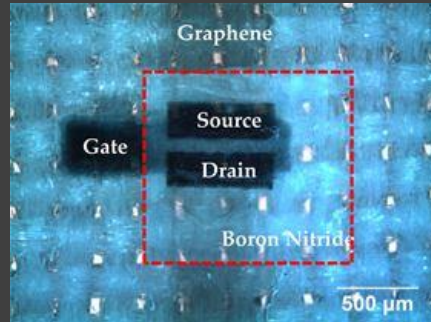


AI
IT

6G Wireless



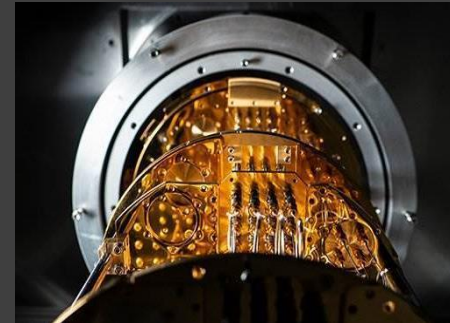
Graphene Plasmonics



Quantum
Nanotech

Quantum
Nanotech

100 Qubit Quantum Computer



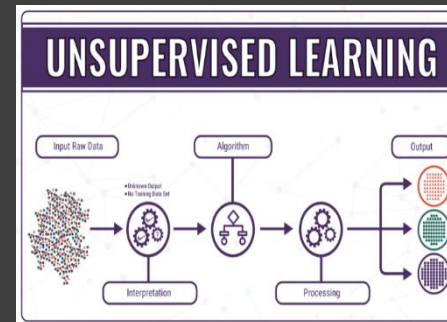
AI for Matl Development



Nanotech
AI

AI

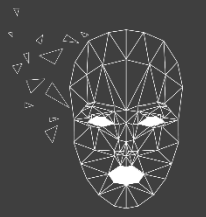
Unsupervised Learning AI



Quantum Internet with Robust PON Architecture



2025-----2030-----2035



TECHNOLOGY
CONVERGENCE 2035

Convergence #2

HIGHLY LIKELY:
Elimination of Mobile Devices
2035

Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

Bio-
Technology

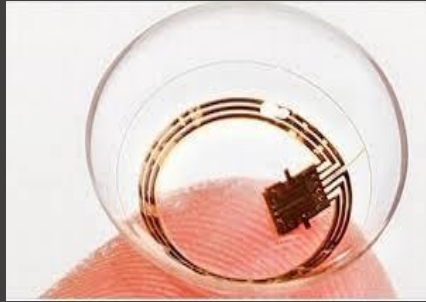
Autonomous
Technology

Robotics

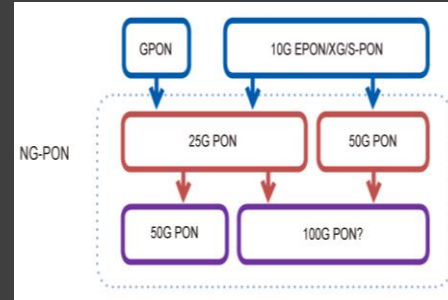
Bionic Corneal Replacement/Smart Contact HUD



Smart Contact Lens



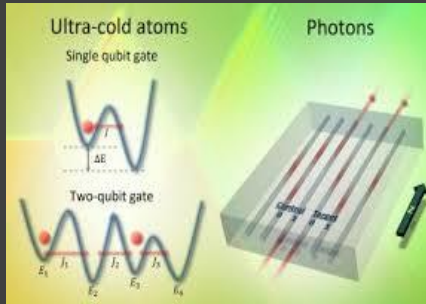
Passive Optic Networks (PON)



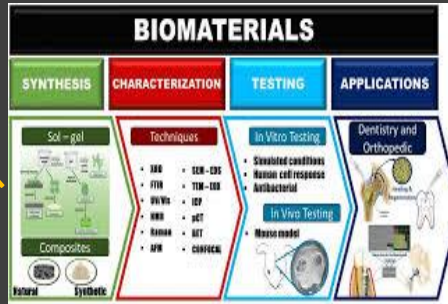
6G Wireless



Scalable Quantum



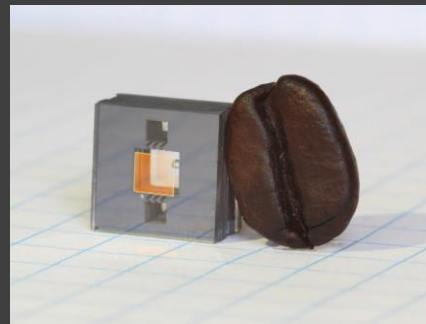
Machine Learning for Biomaterials



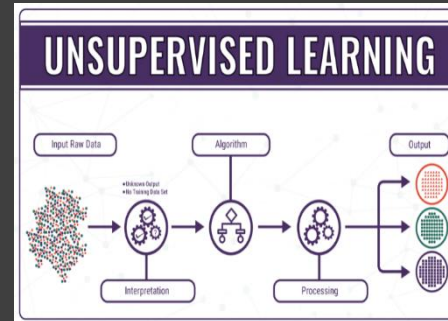
Bionic Corneal Replacement/Smart Contact HUD



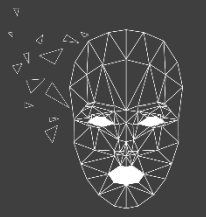
Nano PNT



Unsupervised Learning AI



2025-----2030-----2035



TECHNOLOGY
CONVERGENCE 2035

Convergence #3

*LIKELY:
Sophisticated Automated City Services
2025-2035*

Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

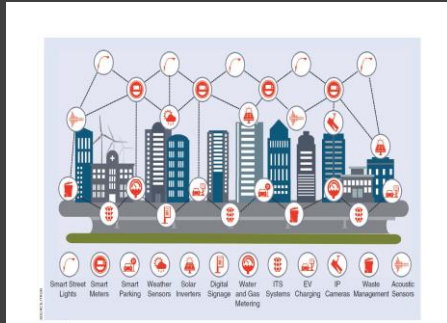
Bio-
Technology

Autonomous
Technology

Robotics

Smart City Sensor to Shooter

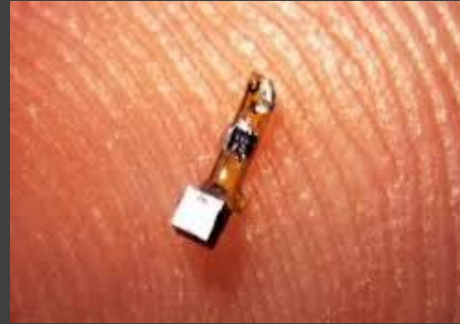
Platform Services



AI

Nanotech
IT

Smart Dust



AI
IT

6G Wireless



Quantum Internet



Quantum
Nanotech
IT

Nanotech
Autonomy
AI
IT

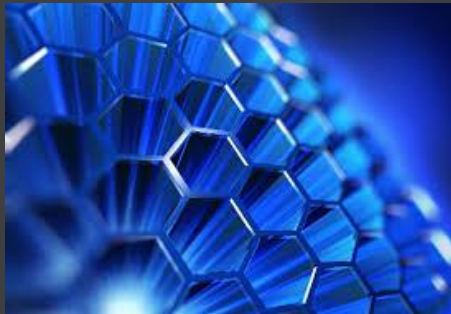
Self Learning Autonomous City



Smart City Sensor to Shooter



AI for Matl Development



Nanotech
AI

Swarm AI

Unsupervised Learning AI



2025-----2030-----2035

Convergence #4

LIKELY:

Autonomous Robotic Colonies To
Support Human Endeavor
2035

Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

Bio-
Technology

Autonomous
Technology

Robotics

Austere Robot Colony



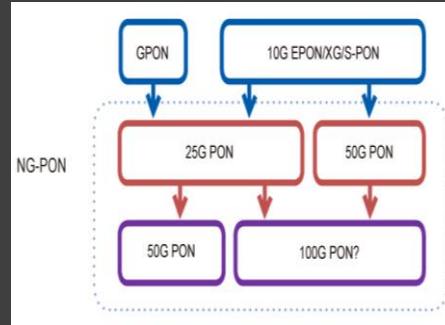
Nanotech
AI

Li-Ion Battery



Next Gen Ethernet PON

IT



Autonomous Ops

Autonomy
Robotics
AI
IT



Austere Robot Colony



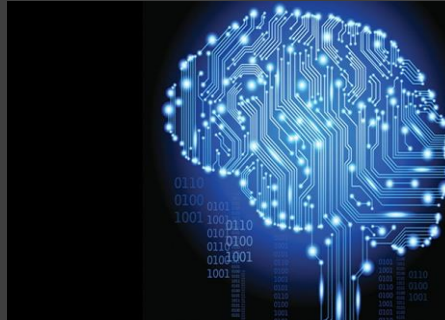
Quantum Internet

Quantum
Nanotech
IT



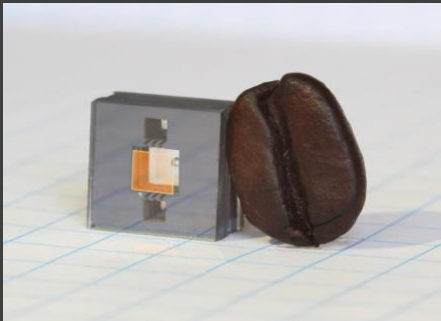
Self-Learning Intelligence

AI



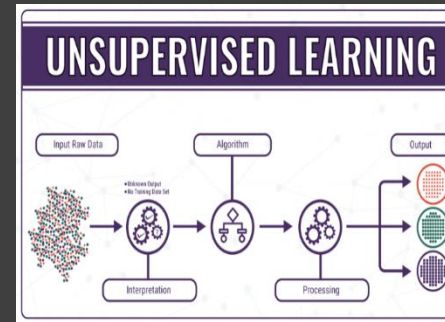
Nano PNT

Nano



Unsupervised Learning AI

AI



2025-----2030-----2035

Convergence #5

LIKELY:

Additive Manufacturing in
Austere Locations

2030

Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

Bio-
Technology

Autonomous
Technology

Robotics

Autonomous Field Deployable Additive Manufacturing



Li-Ion Battery



Nanotech
AI

Quantum Simulation



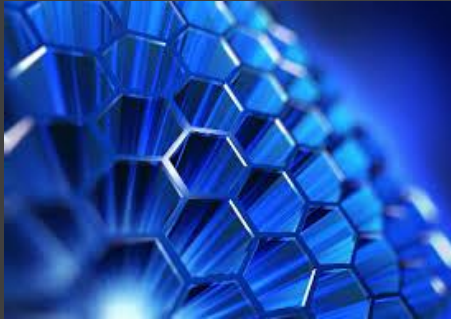
Quantum
IT

6G Wireless



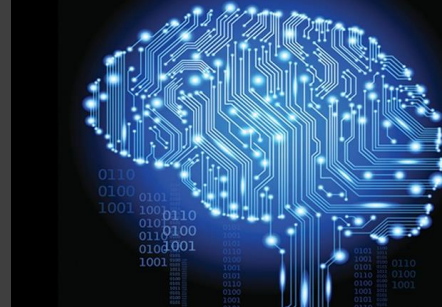
AI
IT

AI for Matl Development



Nanotech
AI

Self-Learning Intelligence

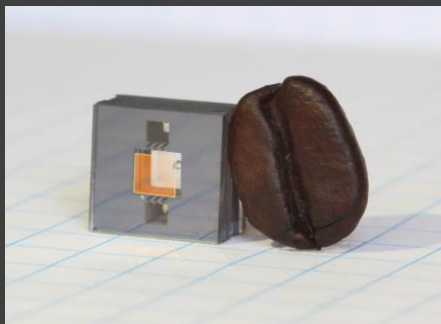


AI

Autonomous Field Deployable Additive Manuf

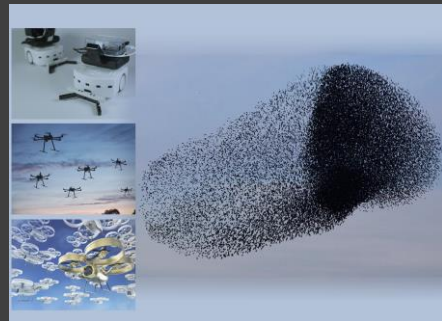


Nano PNT



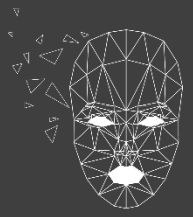
Nano

Robots enabled by AI



AI

2025-----2030-----2035

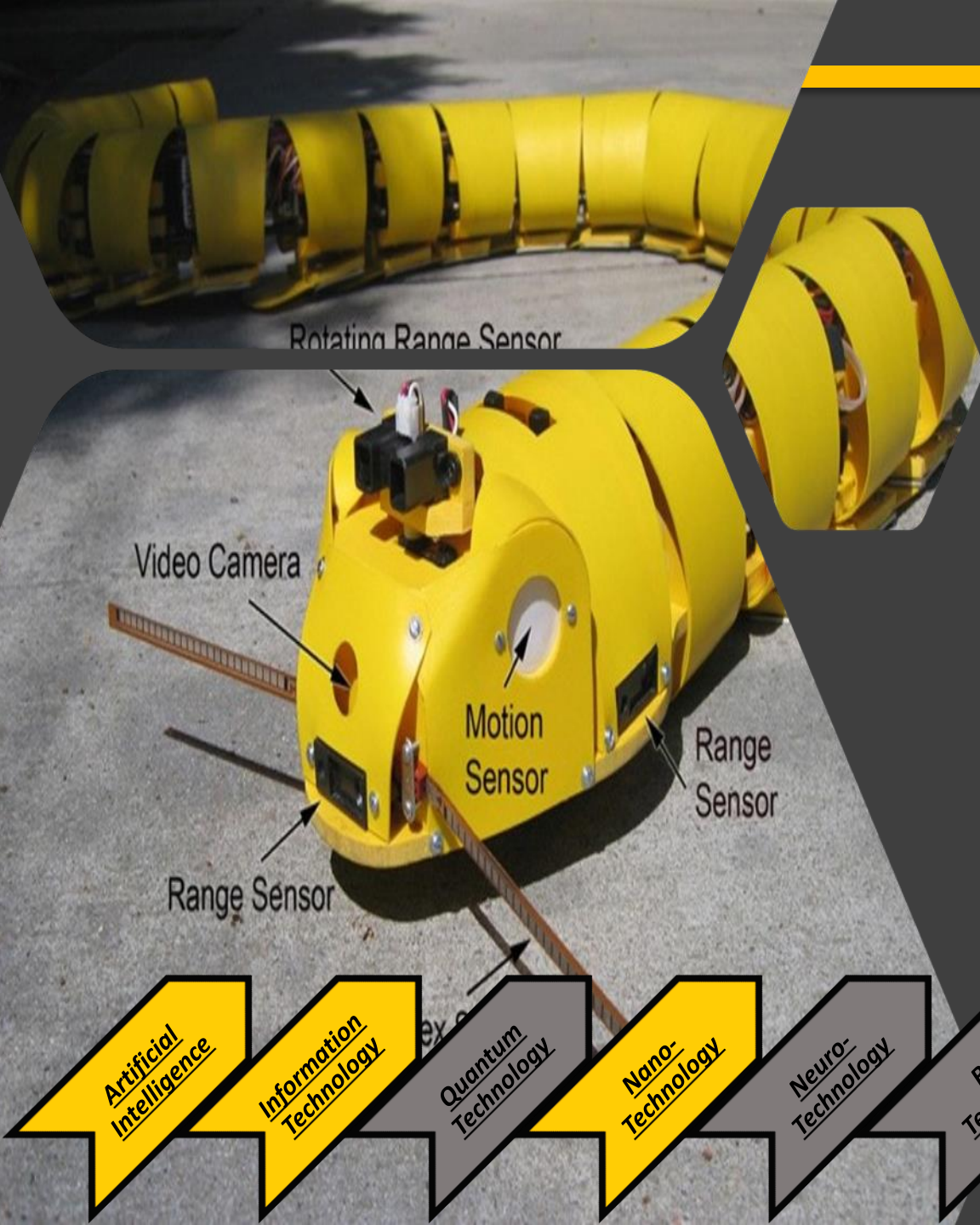


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Convergence #6

LIKELY:

Small Stealthy Robots
2030



Artificial
Intelligence

Information
Technology

Quantum
Technology

Nano-
Technology

Neuro-
Technology

Bio-
Technology

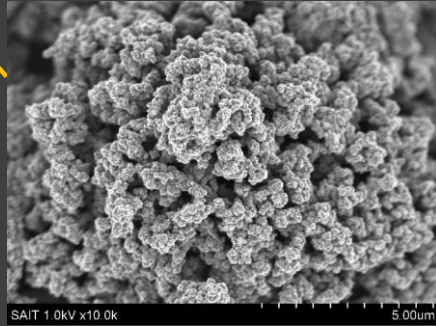
Autonomous
Technology

Robotics

AI Enabled Robot Swarms

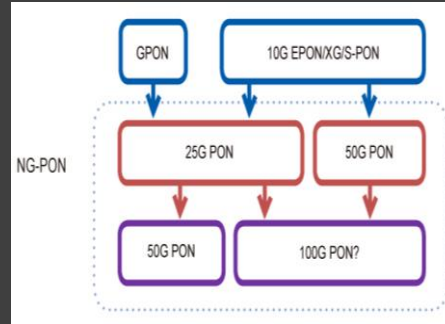


Graphene/Li-Ion Battery



Nanotech
AI

Next Gen Ethernet PON



IT

6G Wireless



AI
IT

AI Enabled Robot Swarms



Quantum Internet



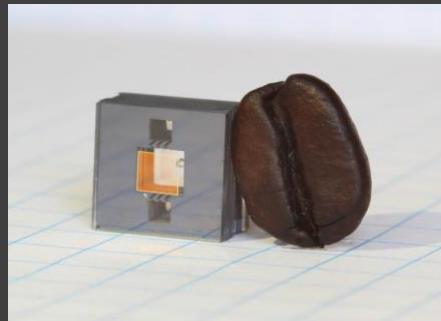
Quantum
Nanotech
IT

Biomimicry



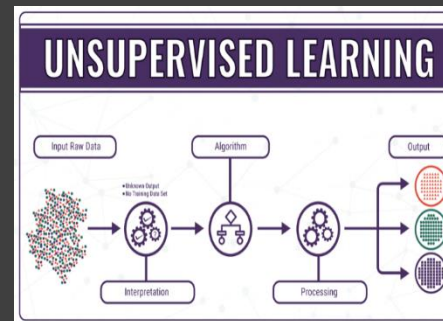
Biotech
Nanotech
AI

Nano PNT



Nano

Unsupervised Learning AI



AI

2025-----2030-----2035

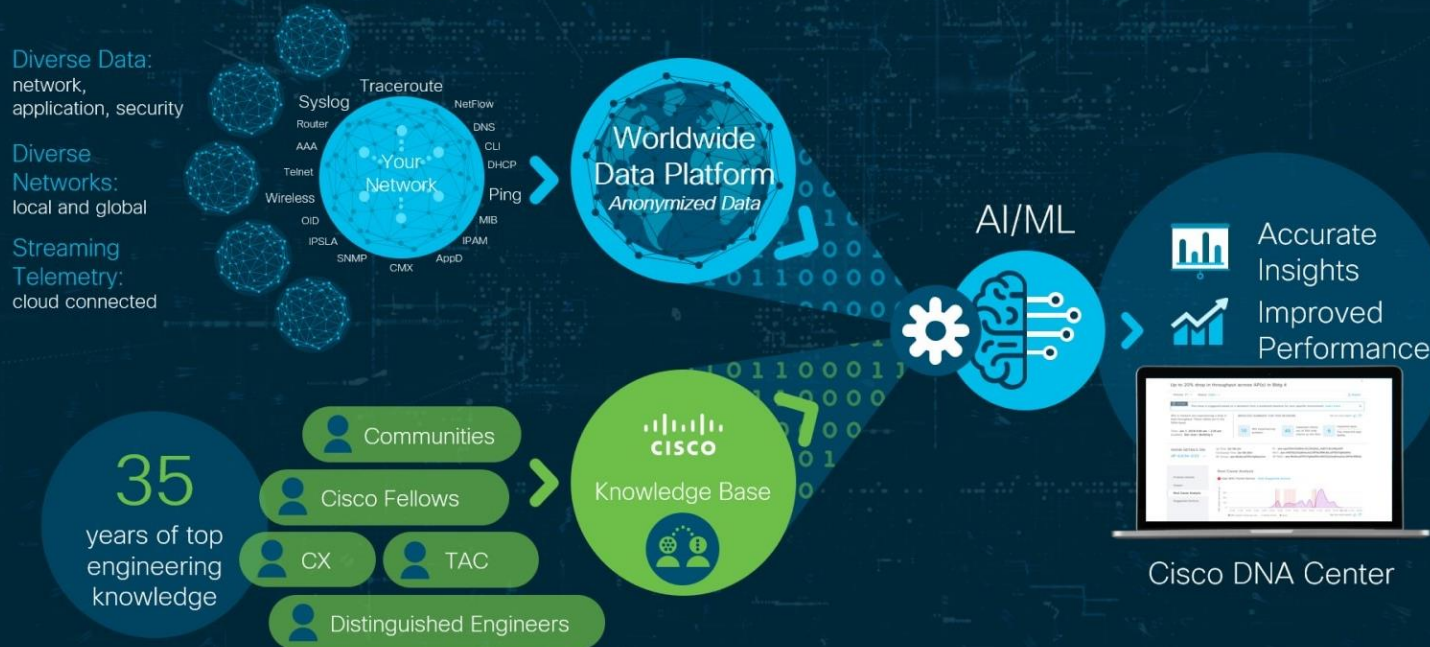
Key Findings

*Shiny Penny is easy to see...may
matter less than the
metallurgical process*

...So What?



Cisco Advantage: Best Data, Best Knowledge Base



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Architecture Matters

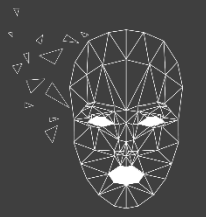
DoD Lacks Understanding

Take-Aways for the Army (and DoD)

Ethics and Regulations only for Ethical



Campaign plans take on another
life when gaming models are
applied...



TECHNOLOGY
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Information Age Leap to the Virtual Age

- V-Information
- V-Development
- V-Industry
- V-Wargaming and Strategy
- V-Hardware
- V-Command and Control



Further Questions and Discussion

Thank you for this opportunity!