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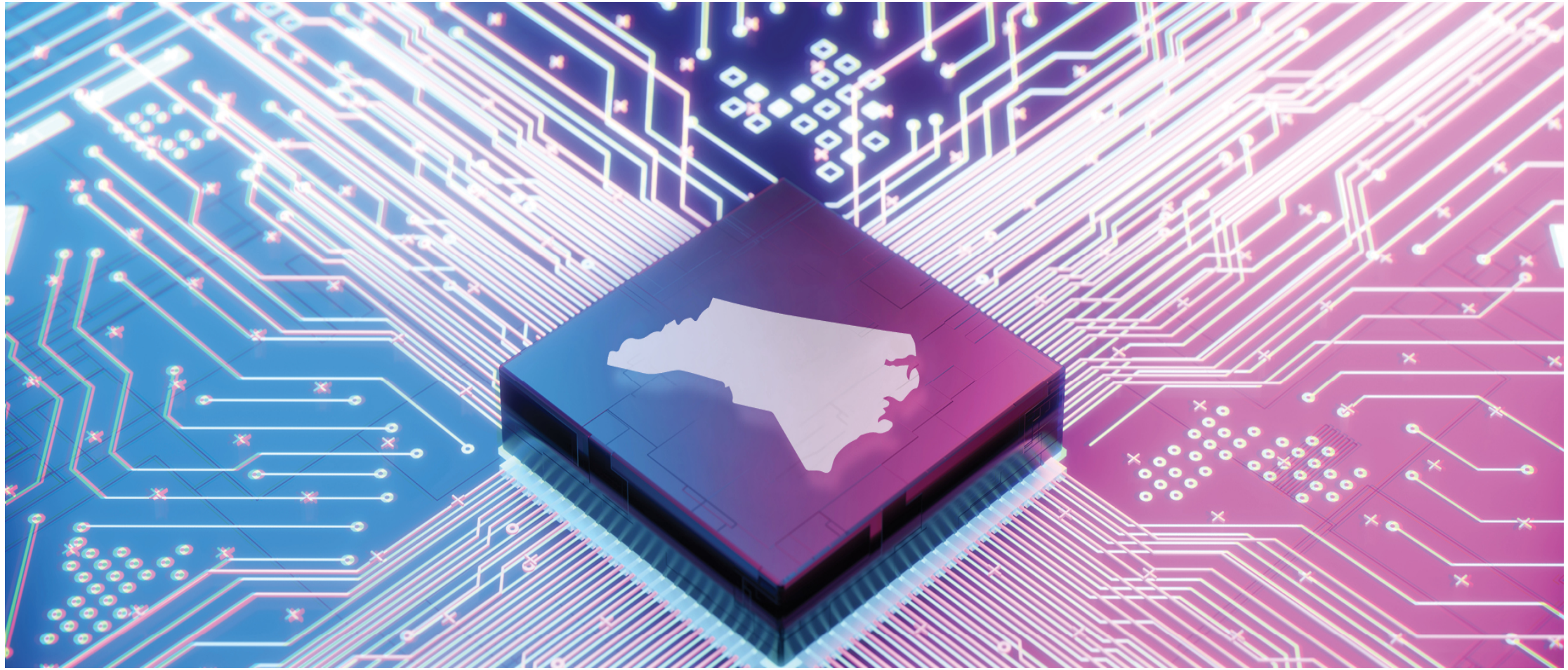
Data Decoded: Defense Opportunities in North Carolina's AI Landscape

Kyle Snyder – Michael Best
Lyle Gravatt – Michael Best
Phil Williams – Defense Alliance of North Carolina

Host: Michael Mullins - North Carolina State University, Industry Expansion Solutions

January 25, 2024

Welcome and Thanks



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Mission

How **prepared** is North Carolina to capitalize on AI's growth?

Which **industries** are expected to be impacted by AI?

Where does **defense innovation** intersect with AI?

Are there **solutions** to deploy or **issues** that need to be explored further?

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Definitions

Artificial Intelligence - a branch of computer science devoted to developing data processing systems that performs functions normally associated with human intelligence, such as reasoning, learning, and self-improvement.

Cloud Computing - model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Internet of Things - network of devices that contain the hardware, software, firmware, and actuators which allow the devices to connect, interact, and freely exchange data and information.

Definitions

Automation

Application of Technology

- Execution of defined instructions
- Predictable outcome
- Deterministic
- Minimal (if any) analysis

AI

Enabling Technology

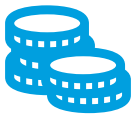
- Machine Learning
  - Large Language Models / Generative AI
  - Neural Networks
  - Deep Learning
  - Computer Vision
- Natural Language Processors
- Symbolic/Expert/Rules/Knowledge-based systems
- Fuzzy Logic

Autonomy

Machine Ability

- Data processing + decision making to perform function
- Situational dependent outcome
- Multiples levels of authorization
- Independent conclusions

Outline



Economy and Labor

Education

Regulatory

Infrastructure

Commercial Sector

Defense

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Economy and Labor

Business Environment
Impact on Labor
Key Sectors
Tech and Startups
Military and Defense

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Business Environment

- #1 State for Business
- Top 3 Cities - Raleigh, Charlotte and Durham
- Attractive Labor
- Low Costs
- Robust Transportation Infrastructure

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Impact on Labor – Automation in NC

North Carolina occupations face more exposure to automation disruptions than US.

Manufacturing, Transportation and Warehousing could face the most automation exposure.

Rural regions likely more affected than urban, further driving inequities.

Higher education can insulate workers from automation concerns.

Federal - Workforce DATA Act of 2023 (Rep. Don Davis of NC)

Impact on Labor – AI Internationally

60% of advanced economy jobs are exposed to AI.

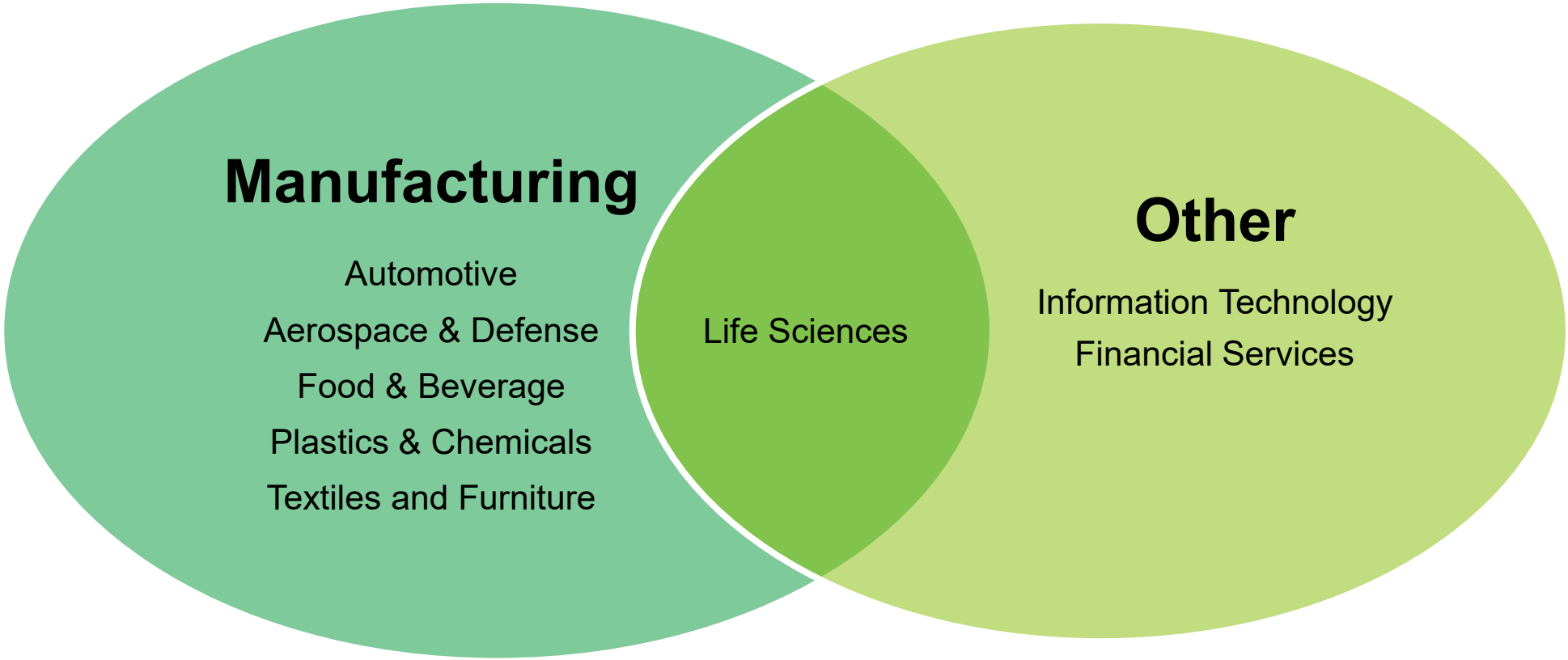
50/50 split between AI Complementing or Displacing occupations.

Women and College-Educated more exposed to Complimentary Uses.

Older and Less Educated more exposed to Displacement (already vulnerable populations).

Service Sector and Cognitive-Intense occupations will face most AI exposure.

Key Sectors



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Tech and Startups

- 9th Largest Tech Workforce
- 2nd Highest Employer of Women in Tech
- 9th In Venture Capital Funding per GDP
- 8th In Startup Job Creation Rate (2021)
- 7th In University Spin-Outs (2021)
- 7th In Academic R&D Funding
- 13th In Total R&D Expenditures

Lack of applied research to commercialize

Underdeveloped VC environment

Regional isolation

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Military and Defense

- 4th Largest Military Footprint in the US
- 13th DoD SBIR/STTR Grants
- 10th Total SBIR/STTR Grants
- 7 Installations
  - Army Research Office
  - Innovation Offices
- 21st Defense Contract Awards
- One NC Small Business Incentive and Matching Grant Programs
- 4 Deep-water Seaports
- 14th Total Defense Spending (includes personnel spend)
- Numerous Public-Private and University Partnerships

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Education

Pipeline
Higher Education

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Education Pipeline

Early Computer Science Education

- 71% of high-school graduates have access to a computer science course.
- SL2023-132 (HB8) mandates a computer science course for graduation.
- AI implementation guidebook for schools released Jan 19 (4th state).

Higher Education – best in class

- 3 Tier-1 research universities
- Most HBCUs in US
- 58 community colleges

Workforce Education

- 3rd highest growth rate in STEM education completions from 2016 to 2021
- 21st for Completing a Bachelor's Degree or higher
- 25th for Completing an Advanced Degree

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NC STATE UNIVERSITY

UNIVERSITY OF NORTH CAROLINA CHARLOTTE

UNCW
UNIVERSITY of NORTH CAROLINA WILMINGTON

ECU

FAYETTEVILLE STATE UNIVERSITY

WAKE FOREST UNIVERSITY

N.C. A&T STATE UNIVERSITY

Duke UNIVERSITY

Military Partners

Regulatory

Political Issues
Government Use
Legislation

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Political Issues

EQUITY

ETHICS AND BIAS

DATA SECURITY

SUSTAINABILITY

SECTOR-SPECIFIC

FEDERAL

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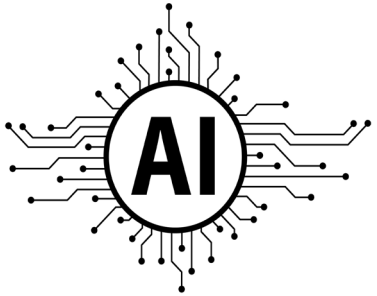
Government Use

Past Digitization



Use Cases

Quality Data

Legislation

- Education and Access
- Taxes and Incentives
- R&D Funding
- Standards for Government Use
- Advisory and Oversight

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Infrastructure

Transmission
Data Centers
Cloud Services
Support Services
Autonomy and IoT
Hardware

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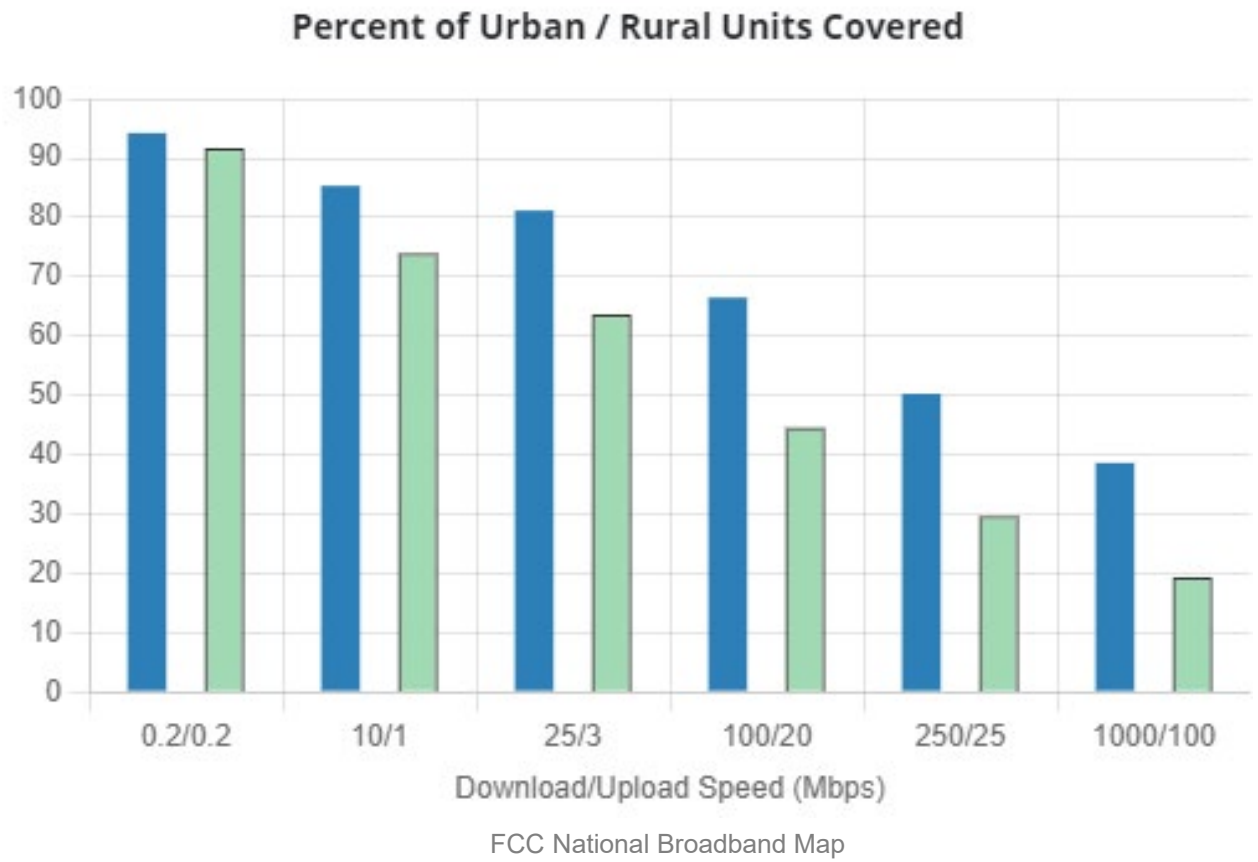
Transmission

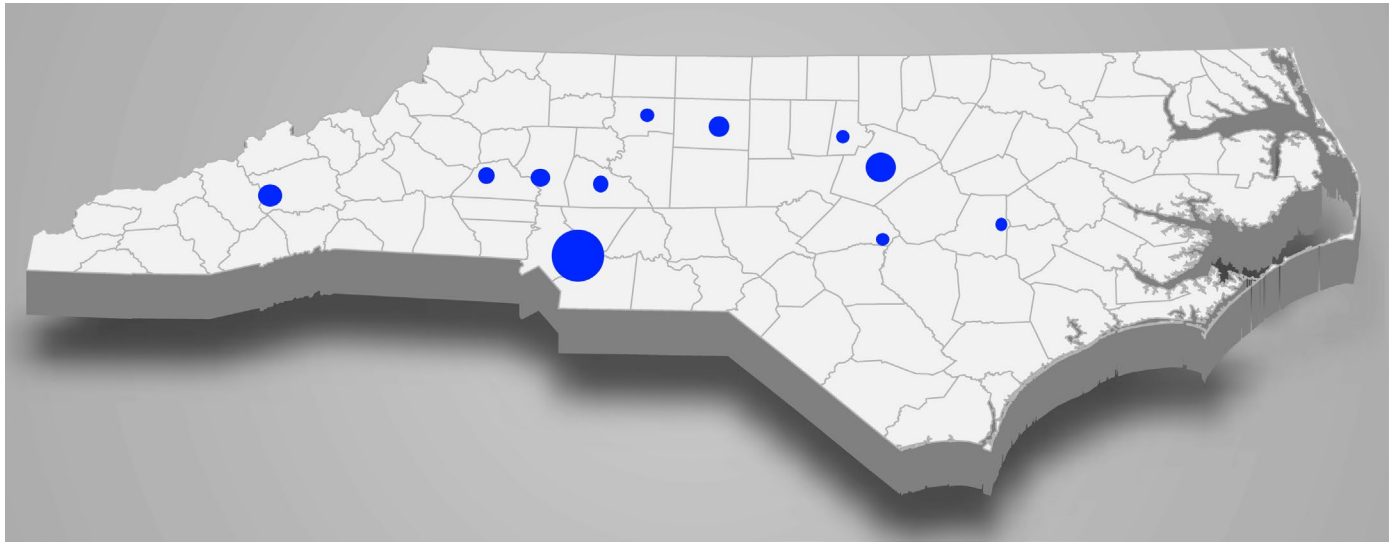


FCC National Broadband Map

- Bandwidth
- Latency
- Access

Data Centers

Locations



National Leader

	State	No.
1	California	254
2	Texas	206
3	Virginia	177
4	New York	124
5	Florida	122
6	Illinois	108
7	Ohio	85
8	Washington	79
9	New Jersey	71
10	Pennsylvania	57
11	Georgia	56
12	North Carolina	56

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Cloud Services

- 22nd in Cloud Infrastructure
- No Physical Infrastructure in NC for Big 3
- NC Department of Information Technology's Cloud Services
- Private Sector Services

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Autonomy and IoT

AUVSI NORTH CAROLINA

BLUE FORCE TECHNOLOGIES

ANDURIL

R!OT™

Anatra

DS Device Solutions
Helping you innovate since 2003.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

CONNECTED DEVELOPMENT

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Hardware

- Semiconductors Processing Units
- Servers Accessories
- Data and Flash Storage
- Networking Equipment
- CHIPS for America Act

Commercial Sector

Core Developers
Supporting Industries
Commercial Utilization
- Advanced Manufacturing
- Life Sciences
- Infrastructure

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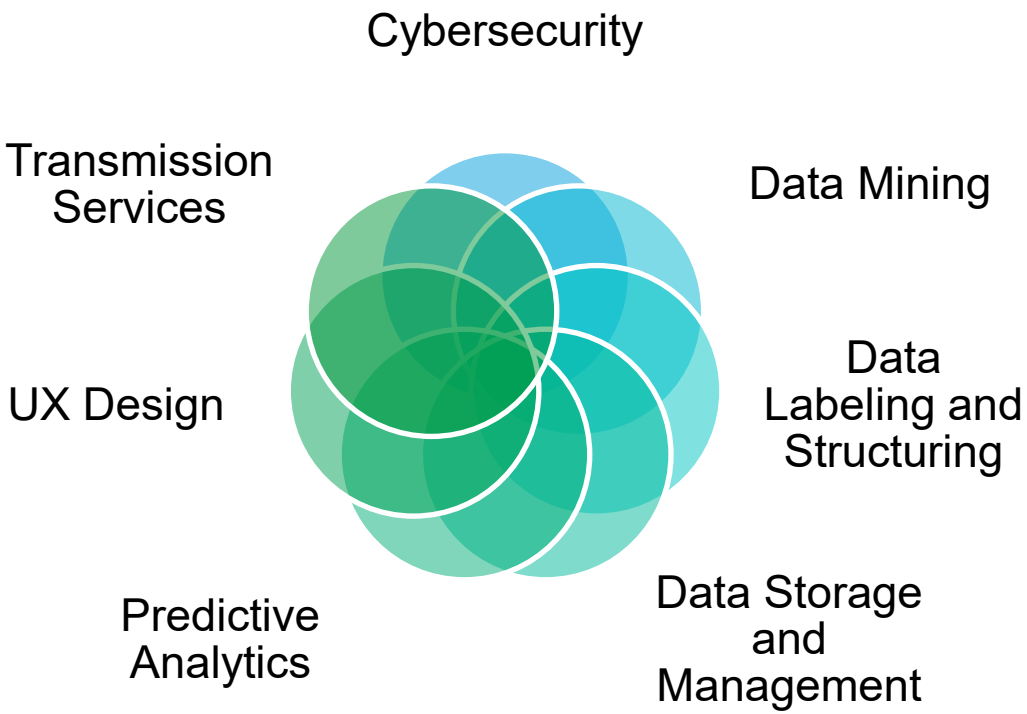
Core Developers

Supporting Industries



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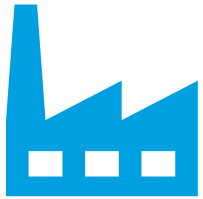
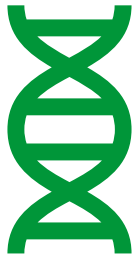
Commercial Utilization



Advanced Manufacturing



Life Sciences

Infrastructure

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Advanced Manufacturing

Aerospace Automotive Industrial

Robotics & Automation

Quality Control & Defect Detection

Predictive Maintenance

Generative Design & Digital Twins

Supply Chain Optimization

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Life Sciences

Agriculture

Health Care

Biotech

1. Farm Management
2. Drug Discovery & Development
3. Diagnostics & Imaging
4. Robotic & Virtual Assistants
5. Patient Privacy

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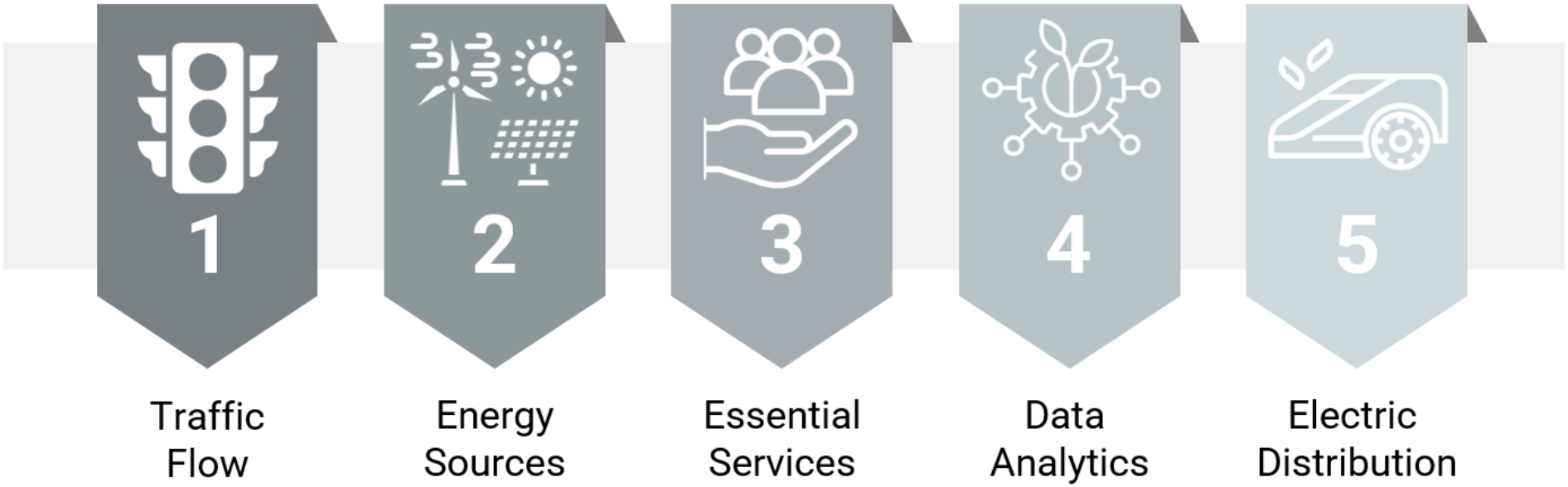
Infrastructure

Transportation

Energy

Govt Services



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Defense Opportunities

DANC Cluster Study
Federal Opportunities
Roundtables

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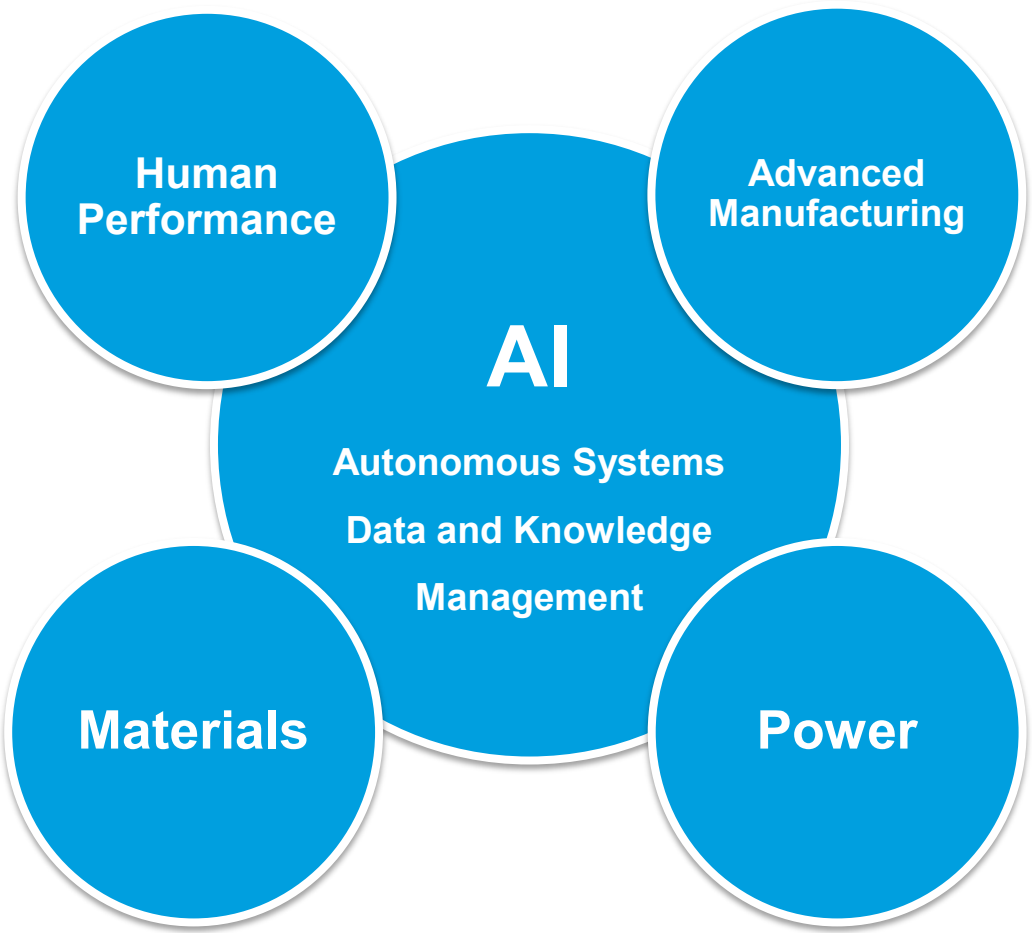
DANC Cluster Study



Federal Opportunities

- DARPA - AI Cyber Challenge and AI Next campaign
- DOE - $70 Million to Strengthen Energy Sector Against Physical and Cyber Hazards
- DoD – GenAI Task Force, AI Adoption Strategy
- NSF - SBIRs and AI Research Initiatives

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Federal Opportunities – NDAA24

- Artificial Intelligence Bug Bounty Programs (Sec. 1542)
- Prize Competition for Technology That Detects and Watermarks Use of Generative AI (Sec. 1543)
- Plans, Strategies, and Other Matters Relating to AI (Sec. 1544)
- Study to Analyze Vulnerability for AI-Enabled Military Application (Sec. 1545)
- Programs for Next-Generation Microelectronics in Support of AI (Sec. 7507)
- Pilot Program on Optimization of Aerial [Refueling] (Sec. 346)

Recent Headlines

Business

Mark Zuckerberg's Biggest Commitment to AI Yet

By Jack Simpson

January 18, 2024 103

'Very scary': Mark Zuckerberg's pledge to build advanced AI alarms experts

Meta CEO accused of being 'irresponsible' by considering making tools on par with human intelligence open source

North Carolina becomes 4th state to create guidebook, implementation for A.I. in schools

by Ed DiOrio | Fri, January 19th 2024

Jan. 19, 2024, 12:10 PM EST

Altman Seeks to Raise Billions for Network of AI Chip Factories

CES 2024: The r1 AI Pocket Companion Will Take You Down the Rabbit Hole

The Rabbit r1 uses AI powered by a Large Action Model to help you perform voice-based searches using natural language commands no matter what you want to explore.

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Roundtable #1

Deploying AI: North Carolina's Innovators & Creators

Thursday, February 8

Hosted at UNC Wilmington

UNCW
UNIVERSITY of NORTH CAROLINA WILMINGTON

Keynote: Dr. John Hardin, Executive Director for the North Carolina Board of Science, Technology & Innovation

Bill Kawczynski, Director of Military Affairs, will be highlighting UNCW's AI work

Panelists and Attendees will be discussing:

- Types of AI Development in NC (research, productized, DoD fielded)
- Development Resources (workforce, infrastructure, testing facilities, incentives)
- Adoption Needs (customer, expectation management, policy updates, release responsibilities, risk assessments)

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Roundtable #2

Defense AI Deployment: Practical & Ethical Concerns of AI-Embedded Warfare

Thursday, February 22
Hosted at TechNet Conference
In collaboration with Fayetteville State University

*Conference registration required.

Unmanned Aircraft Systems Take Flight

Panelists review various defense programs and compliance regimes that continue to grow in light of the private sector growth and battlefield data coming from Ukraine and other sectors.

Moderator: Kyle Snyder, Michael Best
Col. Mathew Elliot, XVIII Airborne Corps
Capt. Max Krasnov, 352nd Special Warfare Training Squadron
TBD, SAS

AI-Embedded Warfare

Panelists discuss goals and challenges of integrating AI and autonomy into defense technologies and doctrine - policies, rules of engagement, and ethical considerations.

Moderator: Erik Berdy, Michael Best
John Turner, DCDAO
Jock Padgett, JSOC
Dr. Hans Mumm, Victory Systems
LTC Ryan Kenny, Commander, 112th Signal Battalion

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Roundtables

AI User Experience: Personnel & Warfighter Perspectives

Thursday, March 21

Hosted at UNC Charlotte

Trends & Pathways to Defense Incorporation

Tuesday, April 2

Hosted at North Carolina A&T

AI Applications within the Defense Industry

Tuesday, April 16

Hosted at East Carolina University

Intersections of AI, Infrastructure & Defense

Thursday, May 2

Hosted at Wake Forest University

Resistance is Futile: Lessons Learned & Paths Forward

Thursday, May 16

Hosted at Duke University

Final Report

Summer, 2024

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