



OLD DOMINION
UNIVERSITY

odu.edu

RESEARCH POWERHOUSE



Old Dominion University is a forward-focused, comprehensive public research institution that deeply values and supports the vast array of faculty research, scholarship and creative interests. In addition to this and to realize its vision of attaining national and international prominence, ODU aims to become a recognized leader in a set of identified strategic research thrust areas and cross-cutting areas of research. These areas leverage and enhance existing faculty expertise and align with the university's broader priorities and strengths, including opportunities that arise from the creation of Macon & Joan Brock Virginia Health Sciences at ODU.

ODU STRATEGIC RESEARCH THRUST AREAS

Other Current
Research

**Coastal
Resilience**

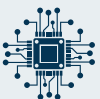
**Health
Innovations**

**Maritime
Systems**

**National
Security**

Future
Opportunities

Cross-Cutting Areas of Research



**Artificial Intelligence
& Machine Learning**



**Autonomous
& Networked
Systems**



**Computational
& Data Science**



**Cybersecurity
& Network Security**



**Modeling
& Simulation**

STRATEGIC RESEARCH THRUST AREAS



Coastal Resilience

Old Dominion University is strategically located to prioritize coastal resilience in its research efforts. ODU is committed to developing strategies to protect and sustain coastal communities and ecosystems from natural hazards and human impacts, such as recurrent flooding, storm surges and urban development. By leveraging cutting-edge technologies, ODU researchers aim to identify potential vulnerabilities and create adaptive solutions. Effective and cost-efficient strategies require collaboration among scientists, engineers, policymakers and local communities to meet specific community needs. Ultimately, ODU's coastal resilience research seeks to protect human lives, property and infrastructure while preserving the ecological integrity of coastal areas, thereby enhancing the sustainability of these critical regions.



Health Innovations

Research in healthcare innovations at Old Dominion University is highlighted by the recent integration of EVMS into ODU, accelerating ODU's ability to be a leader in advancing medical science and improving patient outcomes both locally and globally. ODU researchers are involved in a wide range of activities, including creating novel medical technologies and devices, discovering groundbreaking pharmaceuticals, and implementing cutting-edge digital health solutions and precision medicine techniques. They harness advancements in biotechnology, artificial intelligence and data analytics to design targeted therapies and improve diagnostic accuracy, thereby personalizing healthcare to meet individual patient needs with the goal of developing cost-effective solutions that are accessible and equitable. Collaboration across various disciplines is essential to ODU's commitment to translating research from the laboratory to the bedside.



Maritime Systems

ODU's research focus on maritime systems is advantageously tied to the regional maritime industrial base and encompasses a broad range of interdisciplinary collaborations aimed at enhancing the functionality, safety, resilience and efficiency of maritime operations. This includes advancing areas such as autonomation and autonomy, maritime supply chain and logistics, shipbuilding and ship repair, and smart port management solutions. ODU researchers are also working on enhancing ship design for better energy efficiency. In terms of environmental research, the aim is to reduce the ecological impact of maritime activities and address issues such as marine pollution and the protection of marine biodiversity. Furthermore, ODU's maritime systems research examines socioeconomic factors by analyzing global trade patterns and the economic effects of maritime regulations.



National Security

Old Dominion University's focus on national security research supports regional concentration of military bases, commands and defense contractors, and focuses on understanding and addressing the myriad global threats with the aim of developing technologies and strategies to protect the United States, its infrastructure and its citizens. By leveraging new technologies, advanced analytics, artificial intelligence, and defense-focused innovation, ODU researchers seek to provide more effective ways to anticipate and mitigate risks before they manifest into crises. Our national security research goals range from advancing tools to identify imminent dangers to developing novel technologies for threat detection and deterrence within the increasingly complex geopolitical landscape.

CROSS-CUTTING AREAS OF RESEARCH

Supporting the four strategic research thrust areas are five interrelated cross-cutting areas of research. These integrative areas encompass both emerging and established fields of study, intentionally chosen to align with ODU's broader investments and goals, as well as the expertise of current faculty and local, regional and national needs and trends. A key feature of these cross-cutting areas is their ability to include, engage and support the diverse research, scholarship, and creative interests of faculty across ODU, while also advancing the University's broader objectives.



Artificial Intelligence

Old Dominion University has a long-standing tradition of advancing new and emerging technologies. It continues this legacy by integrating artificial intelligence across various disciplines. ODU employs a transdisciplinary, collaborative and integrative approach to apply AI responsibly, securely and ethically, with the overall aim of advancing research, exploring new applications and driving innovation.

Autonomous Systems

Recently, ODU has enhanced its research expertise in the field of autonomous systems. This includes efforts like developing automated drones for security and environmental modeling, as well as intelligent robotic assistants in manufacturing and healthcare. These systems are designed to analyze large amounts of data, learn from their environment and adjust their behaviors in real-time, thereby enhancing efficiency, safety and reliability across various sectors.

Cybersecurity

Old Dominion University's transdisciplinary approach to cybersecurity research focuses on addressing the ever-evolving threat landscape in the digital world. By collaborating across various disciplines, ODU researchers are improving the ability to protect information, networks and systems from cyber threats, while also ensuring that authorized users have proper and timely access.

Data Science

Data is the driving force behind advancing new technologies, systems and methodologies, and it is essential for modern decision-making. ODU's interdisciplinary approach to data science research enables researchers from various fields to tackle complex challenges where traditional analysis methods may fall short in extracting meaningful insights and patterns.

Modeling and Simulation

ODU is a recognized leader in developing and applying modeling and simulation techniques across various disciplines. These include data science, operations research, decision analysis, medical research, port logistics, maritime operations, environmental health, hazard modeling and systems security. ODU collaborates with industry and government sectors to advance the application of modeling and simulation to emerging areas of regional and national interest.

We recognize the importance and value the full spectrum of faculty research, scholarship and creative activity. The areas of focus are not intended to diminish the importance or support we offer for all our faculty. Rather, these are the areas for which we have and will continue to grow our national reputation.



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