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# UF FACILITIES & OTHER RESOURCES

The University of Florida (UF) is a major, public, comprehensive, land-grant, research university. The state’s oldest and most comprehensive university, UF is among the nation’s most academically diverse public universities. UF has a long history of established programs in international education, research and service. It is one of only 17 public, land-grant universities that belongs to the Association of American Universities ([*https://education.med.ufl.edu/medical-students/student-life/university-of-florida-2/*](https://education.med.ufl.edu/medical-students/student-life/university-of-florida-2/)*)*

UF has a 2,000-acre campus and more than 900 buildings (including 170 with classrooms and laboratories). The northeast corner of campus is listed as a Historic District on the National Register of Historic Places. The UF residence halls have a total capacity of some 7,500 students and the five family housing villages house more than 1,000 married and graduate students.

UF’s extensive capital improvement program has resulted in facilities ideal for 21st century academics and research, including the Health Professions, Nursing and Pharmacy Building; the Cancer and Genetics Research Center; the new Biomedical Sciences Building; and William R. Hough Hall, which houses the Hough Graduate School of Business. Overall, the university’s current facilities have a book value of more than $1 billion and a replacement value of $2 billion.

# HERBERT WERTHEIM COLLEGE OF ENGINEERING (HWCOE)

<https://www.eng.ufl.edu/about/>

The Herbert Wertheim College of Engineering at the University of Florida is the largest professional school, the second largest college, and one of the top three research units at UF.

Established in 1910, the college was named after Distinguished Alumnus Dr. Herbert Wertheim in 2015. Housing one of the largest and most dynamic engineering programs in the nation, its curriculum is offered across ten departments, 15 degree programs, and more than 20 centers and institutes that produce leaders and problem-solvers who take a multidisciplinary approach to innovative and human-centered solutions. It is also the cornerstone of UF’s most ambitious 21st century research, education and economic development vision – the AI University Initiative. The college produces inventions at twice the national average – and startups at five times the national average – for every research dollar spent. Students, faculty and alumni are hailed as New Engineers who aim to reimagine the future of our society.

[*https://www.eng.ufl.edu/facilities/engineering-buildings/hwcoe-building-directory/name/solar-engineering-lab/*](https://www.eng.ufl.edu/facilities/engineering-buildings/hwcoe-building-directory/name/solar-engineering-lab/)

The Herbert Wertheim College of Engineering has over one million gross square feet of facilities. Approximately 75% of the space is assignable square footage utilized for research, administration, classroom, and conference space. Most of this space is located on UF’s main campus. The Engineering buildings on the main campus are located in three general areas, typically referred to as:

North Campus (South of Stadium Rd and North of Museum Rd)

South Campus (South of Museum Rd and North of UF Health/Shands)

Surge Area (South of Performing Arts Center and North of Archer Rd.)

The HWCOE also has 25 other buildings and facilities located off-campus that include the following locations:

East Campus (Located on Waldo Road at 23rd Ave intersection)

Solar Park (South of Archer Rd on SW 23rd Terrace)

Coastal Lab (Located on 6th street, South of Depot Rd)

REEF Lab (Located in Shalamar, FL adjacent to Eglin Air Force Base)

# NEW BUILDINGS

## Herbert Wertheim Laboratory for Engineering Excellence

[*https://www.eng.ufl.edu/about/new-buildings/*](https://www.eng.ufl.edu/about/new-buildings/)

Herbert Wertheim Laboratory for Engineering Excellence is 84,000 square foot state-of-the-art research environment. It is built with the help of a $300 million public-private partnership.

The building has:

* Classrooms and tools to facilitate team-based learning, including freshman design labs.
* Faculty and student collision spaces to encourage cross-disciplinary collaboration.
* State of the art biotech lab to engineer solutions to overcome cancer, cardiovascular and muscular system disorders, and neurodegenerative diseases
* Prototyping Labs to enhance hands-on learning and help develop big ideas.
* Global Teleconferencing Lab to build 21st century communication and networking skills.

## Malachowsky Hall for Data Science & Information Technology

<https://www.eng.ufl.edu/about/new-buildings/>

Malachowsky Hall is a 263,000-square-foot academic building located at UF’s main campus that connects students and researchers from across disciplines and create a hub for advances in computing, communication and cyber-technologies with the potential for profound societal impact.

Malachowsky Hall serves as headquarters or offices for the Computer & Information Science & Engineering (CISE), and Electrical & Computer Engineering (ECE) departments. The Florida Institute for Cybersecurity Research (FICS) and the Warren B. Nelms Institute for the Connected World also have offices in the facility.

Malachowsky Hall’s 30 lab spaces are designed to encourage cross-pollination among researchers from different fields. A high-bay lab, suited for drone research and experiments, is complemented by a viewing area that allows visitors to observe the activity inside.

The building also includes office spaces for student groups and a makerspace that can be reserved for tech workshops and other student-developed collaborations and prototyping.

# RESEARCH FACILITIES

<https://mse.ufl.edu/research/facilities/>

The Herbert Wertheim College of Engineering’s Research Facilities support and enhance the research, education, and public service missions of the University of Florida by providing access to characterization and process instrumentation. Expert staff provides the assistance and guidance necessary so that industry, faculty, and students get the most effective and appropriate use of the center’s facilities.

## Nanoscale Research Facility

The Herbert Wertheim College of Engineering's Nanoscale Research Facility (NRF) support and enhance the research, education, and public service missions of the University of Florida by providing access to characterization and process instrumentation. Expert staff provides the assistance and guidance necessary so that students, faculty, and industry get the most effective and appropriate use of facility resources.

For the user's convenience, the NRF facilities are organized into groups of fabrication and characterization instrumentation and tools:

* [Materials Analysis Instrumentation – Characterization (MAIC)](https://nrf.aux.eng.ufl.edu/maic)
* [Nuclear Fuels and Materials Characterization Facility (NFMCF)](https://nrf.aux.eng.ufl.edu/nfmcf)
* [Cleanroom Fabrication Facilities (CFF)](https://nrf.aux.eng.ufl.edu/cff)
* [Particle Analysis Instrumentation – Characterization (PAIC)](https://nrf.aux.eng.ufl.edu/paic)

The Nanoscale Research Facility (https://mse.ufl.edu/research/facilities/) is a campus-wide resource, different from the normal model of departmental research labs. The NRF supports not just a single discipline but instead stimulates interaction among the disciplines. Core research facilities and labs are established in NRF, and scientists from all colleges work together and share the tools.

The NRF is a two-story building with seven functional areas:

A Class 100-1000 cleanroom facility for nanofabrication and bioprocessing

Advanced electron, optical, and surface imaging laboratories

Core research laboratories for synthesis, processing, characterization, assembly, and testing of nanoscale materials, devices and sensors

General laboratory space for interdisciplinary research collaborations

Offices for faculty, staff and users

Interactive spaces for conferences, informal gatherings, user administration, and surroundings conducive to multidisciplinary interactions

Building support and utility handling areas

### [*Materials Analysis Instrumentation – Characterization (MAIC)*](https://nrf.aux.eng.ufl.edu/maic)

[*https://mse.ufl.edu/research/facilities/*](https://mse.ufl.edu/research/facilities/)

The Major Analytical Instrumentation Center is a materials characterization and analysis facility established to provide analytical support for Florida’s scientific and engineering community in meeting the challenge of technology development. MAIC is a user-oriented facility that provides service to the University of Florida, the state university system, and the industrial and commercial community.

MAIC is organized to maximize the easy accessibility of its facilities. If a user already is properly trained in the use of a particular instrument, access is merely a matter of scheduling. Potential users who are not qualified operators can arrange for instruction. Training is offered on several levels, ranging from simple instrumentation familiarization for experienced users to formal course work available for graduate school credit. A series of short courses are offered, featuring the application of modern research instrumentation to current analytical problems. Typically, these short courses last three to five days and provide a theoretical understanding of the techniques, hands-on practical experience, data analysis and interpretation.

The service component of the MAIC activities is represented by the extensive number of hours in instrumentation appointments, education, training and participation in graduate committees provided by the MAIC staff.

The Materials Analysis Instrumentation - Characterization groups instruments and techniques in the areas of Electron Microscopy, Microanalysis, Spectroscopy, Metrology, Surface Analysis, and X-Ray Analysis.

[MAIC Tool List](https://nrf.aux.eng.ufl.edu/resources/default.asp?s=MAIC) is given at <https://nrf.aux.eng.ufl.edu/resources/default.asp?s=MAIC>.

### [*Nuclear Fuels and Materials Characterization Facility (NFMCF)*](https://nrf.aux.eng.ufl.edu/nfmcf)

*https://mse.ufl.edu/research/facilities/*

The Nuclear Fuels and Materials Characterization Facility (NFMC) at the University of Florida offers users both the equipment approved for radiological use and the necessary staff needed to support the work. NFMC is set up to handle both irradiated materials and fuels with doses up to 300 mR/hr at contact. Currently available equipment includes:

* FEI Helios Nanolab 600 dual-beam focused ion beam/scanning electron microscope (FIB/SEM), equipped with
* EDAX Velocity electron backscattering diffraction (EBSD) and Octane Elite energy dispersive spectrometer (EDS) detectors
* Hysitron PI88 SEM PicoIndenter with heating option (up to 800C) and extended range transducer (>500 mN)
* FEI Tecnai F20 scanning transmission electron microscope (S/TEM) equipped with Gatan UltraScan 1000P camera and EDAX r-TEM super ultra-thin window Si(Li) EDS system.

### [*Cleanroom Fabrication Facilities (CFF)*](https://nrf.aux.eng.ufl.edu/cff)

[*https://nrf.aux.eng.ufl.edu/cff/*](https://nrf.aux.eng.ufl.edu/cff/)

The Cleanroom Fabrication Facility was created to provide a state-of-the-art facility for: university research in micro/nano device fabrication, teaching laboratories associated with micro/nano fabrication, and a collaborative, open environment. The CFF currently houses a 7,000+ sq. ft. clean room class 100-1000 with over 60 fabrication and inspection related tools with a purchase cost of over $8M. The facility and its resources are available to the entire university community and provide an excellent foundation for current research and grant proposals.

[CFF Tool List](https://nrf.aux.eng.ufl.edu/resources/default.asp?s=NRF) is given at this link: <https://nrf.aux.eng.ufl.edu/resources/default.asp?s=NRF>

### [*Particle Analysis Instrumentation – Characterization (PAIC)*](https://nrf.aux.eng.ufl.edu/paic)

[*https://nrf.aux.eng.ufl.edu/paic/*](https://nrf.aux.eng.ufl.edu/paic/)

Equipment list:[*https://nrf.aux.eng.ufl.edu/resources/default.asp?s=PAIC*](https://nrf.aux.eng.ufl.edu/resources/default.asp?s=PAIC)

The Particle Analysis Instrumentation Center (PAIC) grew out of a National Science Foundation Engineering Research Center into one of the premier particle characterization facilities in the US. The Particle Analysis Instrumentation - Characterization (PAIC) groups the instrumentation to synthesize and characterize particulate systems for a wide variety of applications across a broad range of industries. There are over 30 instruments available for analyzing particle size, shape, surface and bulk powder properties along with spectroscopic, imaging and analytical instrumentation for chemical analysis and systems characterization.

The Research & Development Facility is an integral part of the Particle Engineering Research Center at the University of Florida. It includes state-of-the-art instrumentation for particle characterization and analysis. The 17,000 square foot space includes six analytical laboratories, two processing labs, and a 5000 square foot testbed.

## HiPerGator

[*https://www.rc.ufl.edu/get-support/proposal-support/facilities/*](https://www.rc.ufl.edu/get-support/proposal-support/facilities/)

HiPerGator is a university supercomputer that is one of the most powerful among public U.S universities and the world. The core cluster includes the latest generation of processors and offers up nodes for memory-intensive computations. The facility is supported by staff that provides infrastructure, proposal and consulting support to give researchers a competitive edge.

Although the Administration provides for much of the UFIT Research Computing infrastructure, it is still dependent upon faculty research funds for equipment purchases. Without faculty funding, UFIT Research Computing cannot purchase clusters, networking equipment, or storage. Therefore, if you intend to utilize UFIT Research Computing facilities, it is extremely important that you request funding for the center in your grant proposals. The information here is intended to help you as you prepare a budget for your research proposals.

Your proposal can include direct funding for HPC resources in two categories that leverage the investments made by the University in the HPC infrastructure. These categories are hardware and staff consulting services. A proposal can include either hardware, staff support, or both.

Your proposal can list UFIT Research Computing and its resources under the “Facilities, Equipment and Instrumentation” by inserting the text provided in the facilities document. You can augment the text with further descriptions of other facilities used by your project, such as, for example, available NMR instruments and facilities on campus.

*UFIT Research Computing*

In 2011, University made a 5-year commitment to build out the facility into a comprehensive cyber infrastructure for research computing, creating the department of Research Computing as a part of UF Information Technology. The commitment from the University has been renewed because of the success in supporting research computing activities of the faculty, their students, and collaborators. UF Research Computing has grown to a staff of 23 FTE, supporting the work of over 500 faculty-led research groups, with over 5,000 users, of which 500 are active every week.

Further details on UF Research Computing can be found at <https://it.ufl.edu/resources/researcher-resources/> and <http://www.rc.ufl.edu>.

*Network infrastructure and Florida Lambda Rail (FLR) regional network*

The computer systems are located in the University of Florida data center. The machine room is connected to other campus resources by the 400 Gigabit per second campus network and Science DMZ. The network connects HiPerGator to the FLR, from which Internet2, ES.net and other national and international research networks are accessible.

The Florida Lambda Rail (FLR) provides the underlying fiber optic network and network connectivity between these institutions and many others. The FLR backbone completed the upgrade to 400 Gbps in April 2023. The University of Florida is connected to this backbone with two full speed of 200 Gbps links, to be upgraded to 400 Gbps by Dec 2023. UF has had a 400 Gbps path to the Internet2 backbone since Feb 2022 (<https://flrnet.org>).

Universities in the state of Florida joined forces in the Sunshine State Education & Research Computing Alliance (SSERCA), a part of FLR, to share expertise in research facilitation and to support collaborations among researchers in the state of Florida and with researchers everuwhere (<http://sserca.org>).

*High-performance computing and big-data analytics*

UFIT Research Computing operates HiPerGator, UF’s supercomputer, a cluster-based system with a combined capacity of about 70,000 cores in multi-core servers since May 2021. In 2021, HiPerGator AI was taken into production. It is an NIVIDIA DGX A100 SuperPOD donated by alumnus Chris Malachowsky and NVIDIA. It has 17,000 cores and 1,120 NVDIDIA Ampere A100 GPUs with 80 GB or RAM. The HiPerGator systems are connected by an integrated InfiniBand fabric. HiPerGator systems shares over 25 PetaBytes of distributed storage via the Lustre parallel file system. In addition, UF houses about 3.2 PB of storage for the High Energy Physics collaboration of the Compact Muon Solenoid (CMS) experiment. In addition to HiPerGataor AI, HiPerGator 3.0 includes, and 560 NVIDIA GeForce RTX 2080ti and 48 NVIDIA Quadro RTX 6000 GPUs for simulation, machine learning (ML), deep learning (DL), artificial intelligence (AI), and simulation and modeling, available for exploratory and production research, as well as for training and teaching.

The peak performance of HiPerGator 3.0 is around 1 Pflops, that of HiPerGator AI is 17.2 Pflops, which places it at #38 on the top500 list and #14 of the green500 list of Nov 2022. The AI operation performance of HiPerGator AI is 0.7 Eflops.

*Restricted data storage, analysis, computing, and development*

Research projects may involve storing and processing restricted data, including intellectual property (IP), protected health information (PHI), Controlled Unclassified Information (CUI) regulated by Health Insurance Portability and Accountability Act (HIPAA), International Trade in Arms Regulation (ITAR), Export Administration Regulation (EAR), Family Educational Rights and Privacy Act (FERPA).

On Apr 17, 2023, HiPerGator officially met the HITRUST CSF v9.6 risk-based, 2-year (r2) certification criteria, so that researchers can use the full power of HiPerGator for work with PHI and FERPA data. This certification will be renewed every 2 years.

For ITRA/EAR projects, a special enclave environment on the HiPerGator platform <https://www.rc.ufl.edu/documentation/hipergator-rv/>. The HiPerGator-RV/ResVault system is approved for NIST 800-53 “moderate” and NIST 800-171 since Dec 2017.

*Services*

Further details on the services, including the subsidized and the full-cost-recovery price, can be found at the Research Computing web site <https://www.rc.ufl.edu> under Services.

Support for proposal development can be found under Get Support -> Proposal Support.

*Virtual network environments*

By the end of 2014, the campus network infrastructure was upgraded to support virtual network environments. These virtual environments enable extending physical networks beyond their physical boundaries that traditionally coincide with individual buildings. There are three physical networks:

1. The Academic network,
2. The Health network that allows protected health information to be stored and accessed,
3. The Campus Research Network or Science DMZ connecting HPC resources with data generating instruments.

With the virtual network environments, it is possible to connect instruments in any enabled building to the Science DMZ virtual environment, even if the instrument resides in a building that is served by the physical Health network. Similarly, researchers can choose to be connected to the Academic virtual network even if their offices are in a Health network building. The virtual environments allow deployment of the correct policies and security measures on a fine-grained scale to meet the needs of the activities of the people using the network. Further virtual network environments include

1. Administrative virtual network environment, with a level of security in between academic and health.
2. Industrial building control network environment will allow separating traffic for monitoring and controlling building systems from the networks used by the occupants of the buildings.
3. Payment Card Industry virtual environment.
4. ITAR virtual environment to connect that compliant data storage and processing system ResVault in a compliant and secure way to some of the engineering labs where the restricted data is used to create and test export-controlled devices.

*Space, Power and Cooling*

The funding model for Research Computing includes the commitment from the Provost, the VP for Research, and the VP and CIO to provide for machine-room facilities with electrical power and cooling and professional staff. The University has a substantial investment in research computing infrastructure including a data center completed in 2013 on the East Campus that provides 10,000 sq. ft. of machine room space, of which 5,000 sq. ft. is dedicated to house HiPerGator.

*Staffing*

The University pays the salaries of the 23 highly qualified staff members, including several with a PhD or master’s degree in science or engineering. Staff members, in addition to sharing in the system design, installation, and administration duties, provide application support and consulting services to faculty members, their research associates, and their graduate students. This support ranges from assistance with job flow management and installation of open-source software to teaching students how to improve the MPI performance of their programs.

*Training and Outreach*

UFIT Research Computing provides advanced support and training to the user community. Many training materials are now available online. The schedule can be found at <https://help.rc.ufl.edu/doc/Training>.

In addition, user feedback meetings are held as well as periodic training workshops are organized every semester. In 2022 over 60 courses leveraged HiPerGator.

## University of Florida Training Reactor (UFTR)

[*https://mse.ufl.edu/research/facilities/*](https://mse.ufl.edu/research/facilities/)

Constructed in 1959, the UF Training Reactor (UFTR), was one of the first nuclear reactors on a university campus. Today it is one of fewer than 30 such reactors used for education, training, research and testing at colleges and universities around the United States.

The Herbert Wertheim College of Engineering uses the reactor to train students to operate reactors and for laboratory courses in nuclear engineering, physics, chemistry, geology and environmental engineering. The reactor also serves as a radiation/neutron source for various research programs and experiments such as trace element analysis of ocean sediments, soil sediments, plants and biological materials.

Reactor type: Heterogeneous ARGONAUT type

Licensed rated power level: 100 kW thermal

Maximum thermal flux: 1.5×1012 n/cm2sec

Reflector: Graphite (1.6 g/cm3)

Moderator: H2O and graphite

Experiments: Neutron irradiations; neutron activation analysis; neutron radiography, including real-time radiography; detection system use.

# CENTERS & INSTITUTES

<https://www.eng.ufl.edu/research/centers-institutes/>

With strategic initiatives spanning Health, Energy, Sustainability, Security, and Enabling Technologies, the Herbert Wertheim College of Engineering has established the following Institutes as university partners and resources to create opportunities for crossing boundaries and solving society’s most important problems.

* Center for Coastal Solutions
* Center for Privacy and Security of Marginalized and Vulnerable Populations
* Florida Institute for Cybersecurity Research
* Florida Institute for National Security
* Florida Semiconductor Institute
* Institute for Computational Engineering
* Nanoscience Institute for Medical and Engineering Technology
* UF Transportation Institute
* Warren B. Nelms Institute for the Connected World

***Center for Coastal Solutions (CCS) -*** *https://ccs.eng.ufl.edu/about-ccs/*

Florida’s coasts are facing an increasing array of complex, interconnected challenges, including impacts of sea-level rise, flooding, red tide, erosion and more frequent and severe storms. These significant and growing risks affect communities, businesses, infrastructure and ecosystems across the state. The Center for Coastal Solutions works across disciplines to quickly deliver advanced, integrated science and decision-making support to enable stakeholders to analyze, manage and reduce risks.

The Center for Coastal Solutions harnesses a world-class research platform, diverse expertise, AI, supercomputing power and smart partnerships to drive discoveries and shape solutions that empower communities to take action for the future of our coasts.

CCS’ decision support tools (listed below) empower natural resource managers to make smarter, data-driven choices that not only enhance water quality and environmental outcomes but also maximize return on investment—a win-win for both the environment and the bottom line:

* AI-driven red tide detection system
* Septic to sewer conversion optimization tool
* Land conservation optimization tool
* Septic vulnerability assessment tool

Research Pillars:

Florida’s Digital Twin for policy and decision making: CCS has united with multiple units across campus and public-private sectors to develop digital twin technologies that empower stakeholders to make data-driven choices to sustain Florida’s natural resources, protect public health, ensure economic prosperity, and enhance the benefits of future urban planning projects.

Forecasting coastal hazards to prepare for an uncertain future: Our researchers develop advanced forecasting models that more accurately and quickly predict when, where and how severely storm surges and water pollution will affect coastal communities. These models can help guide emergency preparedness and response efforts.

Nature-based solutions to build coastal resilience: Our researchers study how best to incorporate nature-based solutions — such as living shorelines, revegetated coastal dunes, and restored seagrass meadows — into strategies for safeguarding our coasts from erosion and rising sea levels. We work closely with a wide range of stakeholders to ensure that the best available science is applied directly to address the unique challenges facing coastal regions.

Optimizing decisions to protect and improve water quality: We use Earth system modeling, which simulates the physical, chemical, and biological processes that shape our planet, along with AI tools, to pinpoint the root causes of multiple water quality challenges. Earth system models help us understand how the water cycle, ecosystem dynamics, and human activities are connected — and how we can improve the way we manage our vital coastal resources. By predicting the development and movement of water quality hazards, like red tide, we can help reduce their harmful effects on coastal communities and ecosystems.

## Center for Privacy and Security of Marginalized and Vulnerable Populations (PRISM)

[*https://prism.eng.ufl.edu/*](https://prism.eng.ufl.edu/)

Computing systems and services are an essential part of modern society and are deeply embedded in people’s daily lives. However, as practices and technologies for ensuring security and privacy of computing systems emerge and rapidly change, the needs of marginalized and vulnerable populations have been under-addressed, as have the consequences of their exclusion. This Frontiers-scale project seeks to fundamentally change how security and privacy in computing is approached, to make centering the needs of marginalized and vulnerable populations the norm.

To do so, the team of researchers will create security and privacy design principles that mitigate harm and enhance the benefits of both current and future computing technologies. This work will be informed by direct collaboration with marginalized and vulnerable communities and by strong technical foundations and social science theories. This project will build and sustain a community of researchers to ensure that the needs of marginalized and vulnerable populations are centered in security and privacy over the long term. Such work will develop research methodologies and outcomes that inform design, education, and policy to impact the scientific community and society at large.

The project focuses on examining three major themes: assessing the security and privacy needs of marginalized and vulnerable populations, informing and co-creating solutions that intersect with current and emerging technologies, and systematizing and applying foundational design principles. The first area involves quantitative and qualitative human-centered research methods and direct community input to address the unique challenges and needs of different populations. The second area involves identifying how technology can be leveraged or reimagined to address these needs through methodologies that consider security and privacy goals for systems and data. The final area involves iteratively synthesizing lessons and experiences from the previous two areas to support integrating security, privacy, and safety needs of marginalized and vulnerable populations into future technology design and researcher efforts.

## Florida Institute for Cybersecurity Research (FICS)

*https://fics.institute.ufl.edu/*

The Florida Institute for Cybersecurity Research (FICS Research) was established to be the nation’s premier multidisciplinary research institute in the advancing of cybersecurity as a basis for long-term partnership and collaboration among industry, academia, and government. FICS Research’s mission is to directly support the research needs of industry and government partners with pooled, leveraged resources and maximized synergy and to enhance the educational experience for a diverse set of top-quality graduate and undergraduate students. FICS Research will advance knowledge and technologies in this emerging field and ensure commercial relevance of the research with rapid and effective technology transfer and establishment of spin-off companies.

FICS Research is unique. It is arguably the only institute in the country that provides excellent expertise in all aspects of cybersecurity and assurance including hardware, networks, mobile, big data, internet of things (IoT), applied cryptography, machine learning, social sciences, law, and more.

Florida Institute for National Security

## Florida Semiconductor Institute (FSI)

[*https://fsi.institute.ufl.edu/*](https://fsi.institute.ufl.edu/)

The Florida Semiconductor Institute (FSI) serves as the statewide hub for research, development, and workforce initiatives in semiconductor technologies. FSI expertise encompasses emerging materials, chip design, process development, microsystems, heterogeneous integration, advanced packaging, and cybersecurity. Dedicated to making Florida a global leader in specialty electronics, FSI drives high-impact R&D programs, expands the talent pipeline, and coordinates the state’s semiconductor ecosystem. FSI works closely with companies to provide information and support, to achieve mutual growth and prosperity. FSI will work towards catalyzing over 10,000 new high-wage jobs, foster public-private partnerships, and in so doing, expand the semiconductor industry throughout the state of Florida.

## [Florida Institute for National Security](https://fins.institute.ufl.edu/?_gl=1*kk0tvr*_ga*MTE2MDM0ODMwMy4xNjY0OTA3MTM4*_ga_E3NF1GPNLD*MTczMDMxODc2OC4yNC4xLjE3MzAzMTk2OTQuMC4wLjA.) (FINS)

[*https://fins.institute.ufl.edu/*](https://fins.institute.ufl.edu/)

The Florida Institute for National Security (FINS) is an interdisciplinary, cross-curricular initiative to galvanize the robust research efforts in Artificial Intelligence (AI) already underway at the University of Florida (UF). As such, FINS is transforming into the nation’s leading hub for applied AI in support of national security, both domestic and abroad. FINS emerges in support of UF’s AI Initiative to make AI the centerpiece of a major, long-term push to synthesizes world-class research infrastructure, cutting-edge research, and a transformational approach to curriculum. FINS extends this mission to the development of deployable applied AI in support of the most challenging and pressing national security issues, such as transportation, economy, infrastructure, supply chain, ecological and climate threats, and economic and other threats from other nations. As such, FINS will serve as a globally renowned strategic asset for research and development of AI’s application and solutions to national security problems.

FINS and UF strive to be nationally recognized as the premier provider of AI talent for the national security and defense communities and innovation leaders for AI-enabled national security. In coordination with UF’s AI Initiative, FINS leads UF in workforce development for the classified community. To do so, FINS stands at the fore of the development of facilities and programs to enable new avenues of funded research and to secure internships and co-ops with defense and national security agencies, other federal agencies, the government contractors who support the government, and for UF’s students, the next generation of the AI workforce. The National Security Commission on Artificial Intelligence (NSCAI)—a bipartisan commission of 15 technologists, national security professionals, business executives, and academic leaders—recently published a report which identifies the increasing need for a digitally-literate workforce, specifically an AI-literate workforce. FINS, in coordination with UF’s new Quality Enhancement Plan (QEP): AI Across the Curriculum, will work to provide UF students the AI skills and experience needed to lead this next-generation workforce in support of the now evident need to improve and increase domestic talent in AI work, particularly AI work tied to national security.

***Institute for Computational Engineering (ICE)***

[*https://www.eng.ufl.edu/ice/*](https://www.eng.ufl.edu/ice/)

Computational methods have clearly become the third pillar of science and engineering investigation, along with theoretical and experimental approaches. ICE’s educational paradigm must prepare students towards this emerging reality of simulation and data-enabled decision-making in problems of industrial, national and societal importance. Modern scientists and engineers must be well trained in their respective disciplines and in computational techniques to generate high quality datasets, manage these voluminous datasets to identify key quantities of ultimate significance, establish rigorous uncertainties, and evaluate probabilistic risks and rewards involved in the final decision-making.

To meet this growing challenge, the Herbert Wertheim College of Engineering at the University of Florida has established the Institute for Computational Engineering (ICE) to promote world-class education and training in simulation science and engineering. The institute will have three primary focuses: Education, Research and Service. The educational program will be credentialed by a Graduate Certificate in Scientific Computing. The institute will promote interdisciplinary research in computational science and engineering with a novel research paradigm where the focus will be on large-scale simulations and scientific data with a clear purpose of decision making. The Institute will serve as the coordinating body for promoting large center-level computationally-oriented multi-disciplinary research activities, which spans across many departments. By educating and training undergraduate and graduate students to become world leaders in using predictive simulations and data-enabled for science and engineering, the Institute will serve the growing need for simulation and data-driven decision making in problems of national importance. In summary, the education and research components of the institute will instill and encourage competitive and innovative spirit in students, research staff and faculty.

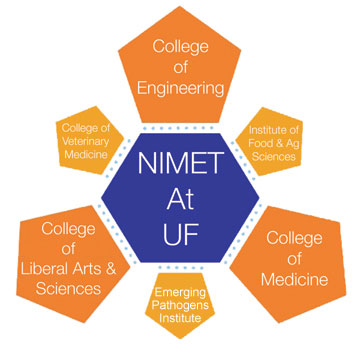
Key Aspects:

* Education and research programs that complement the existing high-performance computing infrastructure.
* Leveraging the significant investment in high performance computing equipment and infrastructure already present at the UF for greater breadth and depth of service and offering.
* A platform that brings together expertise in computational science & engineering across the university and beyond.
* Promote excellence in fields including computational biology, computational fluid mechanics, computational materials, computational electronics, computational pharmacology, bioinformatics and computational chemistry, among others.
* Facilitate organization of center-level funding in areas of National security, Energy and Sustainability, Green computing, Nano-engineering and Healthcare.
* As a Center of Excellence that  attracts and retains top-notch faculty and students.

Programs and Services

* Graduate Certificate in Scientific Computing
* ICE-Graduate-Fellowship center and award
* Coordination of computationally oriented large center-level proposals
* ICE seminar series
* Annual Computational Engineering Symposium
* Promote and coordinate undergraduate research in computational engineering and sciences
* Recruit top-notch faculty and students in computational engineering and sciences
* Coordinate with UF HPC

## Nanoscience Institute for Medical and Engineering Technology (NIMET)

*https://www.eng.ufl.edu/nimet/*



The Nanoscience Institute for Medical and Engineering Technology (NIMET) is a university-wide institute administered by the Herbert Wertheim College of Engineering. Research in fields that study, engineer, or apply nanoscale breakthroughs at UF has grown in multiple disciplines across the entire campus and now involves over 280 faculty and staff in physics, chemistry, biology, medicine, engineering, food/agricultural sciences, and more.

NIMET serves to enable and support research and educational activities at the University of Florida in all fields of nanoscale science, engineering, and technology. In addition, NIMET facilitates the collaborative engagement needed to develop and adapt nanotechnologies for novel medical, engineering, scientific, and agricultural applications.

## UF Transportation Institute (UFTI)

[*https://www.transportation.institute.ufl.edu/about/*](https://www.transportation.institute.ufl.edu/about/)

The UF Transportation Institute located in the Herbert Wertheim College of Engineering aims to advance transportation, disseminate research results, and provide educational opportunities related to transportation. The UFTI brings together faculty, staff, and students from many diverse backgrounds to provide solutions to a variety of transportation problems. The Institute was renamed from the Transportation Research Center (TRC) to the UF Transportation Institute in 2013. The Institute is an umbrella organization housing several other transportation-related centers within the University of Florida. It houses McTrans, the largest transportation software dissemination center in the world, and the Florida Transportation Technology Transfer (T2) Center, which provides training and technical assistance to professionals around the country and internationally. Additionally, the UFTI is home to the Southeastern Transportation Research, Innovation, Development and Education (STRIDE) Center, one of ten Regional University Transportation Centers (UTCs) funded by the US Department of Transportation (USDOT).

## Warren B. Nelms Institute for the Connected World

[*https://iot.institute.ufl.edu/about/*](https://iot.institute.ufl.edu/about/)

The Warren B. Nelms Institute for the Connected World was established to lead research and education in all aspects of the intelligent connection of things, processes, people, and data that address major world challenges including health, energy, transportation, and manufacturing.

Together with industry, university, and government partners, the Nelms Institute develops broad, interdisciplinary Internet-of-Things (IoT) technologies, applications, and policies to create more secure and connected communities. To fuel the next industrial revolution, the Institute will promote tech transfer, entrepreneurship, policy, education and outreach in IoT and its integral components of sensors, low-power embedded processing, communication, networking, cloud computing, data analytics, machine learning, security, privacy and trust.

Since its inception in 2017, the Warren B. Nelms Institute for the Connected World has worked toward becoming a national leader in the education and research on Internet of Things (IoT) Innovation. Under the leadership of Dr. Swarup Bhunia, Director, and Dr. My T. Thai, Associate Director, the Warren B. Nelms Institute has developed broad IoT technologies and applications to create more secure, efficient, and connected communities.

The Nelms Institute has a multi-disciplinary team of 60 expert faculty and leading cohort of over 120 graduate and undergraduate researchers. The institute is exploring new ways to use connected IoT technology to solve major health, energy, transportation, environmental, and manufacturing issues while also remaining focused on the privacy and security of people utilizing smart devices.

With billions of IoT-connected devices already in the world today—and billions more in the coming years—the institute is enabling University of Florida to remain at the forefront of this burgeoning field while creating a critical mass of expertise at the convergence of Artificial Intelligence (AI) and IoT.

# RESEARCH CENTERS AND INSTITUTES

[*https://www.eng.ufl.edu/research/centers-institutes/*](https://www.eng.ufl.edu/research/centers-institutes/)

* [Center for Applied Optimization (CAO)](http://www.ise.ufl.edu/cao/)
* [Center for Intelligent Machines and Robotics](https://cimar.mae.ufl.edu/)
* [Center for Manufacturing Innovation (CMI)](http://cmi.mae.ufl.edu/)
* [Florida Bridge Software Institute](https://bsi.ce.ufl.edu/)
* [Howard T. Odum Center for Wetlands](http://www.cfw.ufl.edu/)
* [Water Resources Research Center](http://wrrc.essie.ufl.edu/)
* [William W. “Bill” Hinkley Center for Solid and Hazardous Waste Management](http://www.hinkleycenter.org/)

## [Center for Applied Optimization (CAO)](http://www.ise.ufl.edu/cao/)

The Center for Applied Optimization at the University of Florida is an interdisciplinary center that encourages joint research and applied projects among faculty from engineering, mathematics, health, and business. It also encourages increased awareness of the rapidly growing field of optimization through publications, conferences, joint research, and student exchange. It was founded in September 1992 by Dr. Donald Hearn of Industrial and Systems Engineering and Dr. William Hager from the Mathematics Department. The current co-directors are Dr. Yongpei Guan and Dr. William Hager, while Dr. Panos Pardalos continues as immediate-past co-director. Center affiliates include several faculty from ISE, Civil Engineering, Aerospace Engineering, Computer and Information Science, Mechanics & Engineering Science, Electrical Engineering, Mathematics, and Decision and Information Sciences.

The center aims to promote theoretical research and algorithm developments for optimization, including continuous optimization, discrete and combinatorial optimization, stochastic optimization and infinite dimensional optimization including optimal control.

the integration of optimization with variant domains including artificial intelligence, data science, energy, health, medicine, social networks, and transportation.

The Center is interested in promoting collaboration with researchers at other universities and organizations through visitors and student exchange. It administers a program for visiting students from the Royal Institute of Technology (KTH), Stockholm.

## Center for Intelligent Machines and Robotics

*https://cimar.mae.ufl.edu/*

The Center for Intelligent Machines and Robotics was founded in the 1970’s by Professor Del Tesar to be a leading center for interdisciplinary basic and applied research related to the many aspects of robotics. From 1986 to 2002 Professor Joseph Duffy guided the Center’s activities at which time many significant contributions were made in the area of spatial mechanism analysis.

The Center continues to strive to be a leader in research and development in the areas of mechanisms, autonomous vehicles, and intelligent machines. Significant accomplishments by both the faculty and graduate students have led the way and created new and fruitful areas of research.

## [Center for Manufacturing Innovation (CMI)](http://cmi.mae.ufl.edu/)

[*https://cmi.mae.ufl.edu/*](https://cmi.mae.ufl.edu/)

Manufacturing at UF focuses on performing state-of-the-art research to produce innovative manufacturing and surface technologies. These technologies enable improved product performance and breakthroughs in water, food production, energy, aerospace, and healthcare systems. Students from the high school to graduate levels are trained to have strong analytical/computational modeling capabilities coupled with sound experimental techniques and data analysis skills.

While the historical focus has been macro-scale manufacturing applications, with the addition of new faculty and facilities, new activities at the micro- and nano-scale are underway. Current research areas include:

* 3D printing with applications to human tissue fabrication
* Magnetic field-assisted finishing
* Micro- and nano-manufacturing
* High-performance machining of advanced materials
* Modeling and sensing of machining processes

## Florida Bridge Software Institute (BSI)

[*https://bsi.ce.ufl.edu/*](https://bsi.ce.ufl.edu/)

BSI is headquartered at the University of Florida. The faculty, staff, and students on BSI team are uniquely positioned to draw from a combination of academic, government, and industry resources. In turn, BSI’s goals include enhancement, maintenance, and dissemination of bridge software to address the increasing demands placed on infrastructure systems. BSI is dedicated to solving the next generation of large-scale bridge engineering problems through the development of geo-structural software*.*

## [Howard T. Odum Center for Wetlands](http://www.cfw.ufl.edu/) (CFW)

[*https://cfw.essie.ufl.edu/*](https://cfw.essie.ufl.edu/)

The Howard T. Odum Center for Wetlands (CFW) is a Type II center dedicated to facilitating wetland programs at the University of Florida and helping in the intellectual marketing and transfer of these programs at the state, national and international levels. Cutting across campus departments and disciplinary areas, the CFW fosters interdisciplinary research, teaching, and service regarding wetlands and related resources with an emphasis on sustainable patterns of humanity and environment.

The H.T. Odum Center for Wetlands and Center for Environmental Policy have been generating publications related to environmental issues since their inception. Digitization of these publications began in the summer of 2004 as a cooperative project with the Digital Library Center, University of Florida Libraries, creating the Howard T. Odum Center for Wetlands Publications. Publications include research reports, articles, book chapters, dissertations and theses, and are freely available to anyone. This is an ongoing project and only those publications without copyright restriction will be included.

## [Water Resources Research Center](http://wrrc.essie.ufl.edu/) (WRRC)

[*https://www.essie.ufl.edu/wrrc/*](https://www.essie.ufl.edu/wrrc/)

The mission of the Florida Water Resources Research Center (WRRC) at the University of Florida is to facilitate communication and collaboration between Florida’s Universities and the state agencies that are responsible for managing Florida’s water resources. The primary focus of this collaborative effort is the development of graduate research and training opportunities in critical areas of water resources that are targeted to meet Florida’s short and long-term needs. The student-lead projects are selected by WRRC partners within Florida’s five Water Management Districts and Department of Environmental Protection in order to produce results that will have immediate impact on water resources management and practice within the state of Florida.

The Center maintains a library of technical reports that have been published as a result of past research efforts (Dating back to 1966). Several of these publications are widely used resources for water policy and applied water resources research in the state of Florida and are also frequently requested by interested parties both nationally and internationally. As part of the WRRC information and technology transfer mission, the library was converted to digital form in 2010 and is provided free to the public through the WRRC Digital Library.

## [William W. “Bill” Hinkley Center for Solid and Hazardous Waste Management](http://www.hinkleycenter.org/)

[*https://www.hinkleycenter.org/*](https://www.hinkleycenter.org/)

The Solid Waste Management Act of 1988 created the center, to coordinate research, training, and service activities relating to waste management. Following a request for proposals process, the Chancellor of the Board of Regents designated the University of Florida to be the Host Institution. On July 1st 2006, The Florida Center for Solid and Hazardous Waste Management in Gainesville was designated as the “William W. ‘Bill’ Hinkley Center for Solid and Hazardous Waste Management” in honor of Bill Hinkley, a pivotal figure in Florida’s solid waste sphere.

The core mission of the Hinkley Center is to sponsor, conduct, and coordinate research that addresses Florida’s solid and hazardous waste management issues and challenges. The Hinkley Center is focused on research that is pragmatic, applied, timely, and useful to the Florida Department of Environmental Protection, local governments, and the private sector.

Each year, the Hinkley Center issues a research agenda and requests proposals from researchers at Florida’s public and private universities and colleges. Researchers are invited to submit a pre-proposal for topics suggested on the research agenda, or other solid and/or hazardous waste topics that the researcher believes will benefit Florida’s communities.

Research Selection process is given at <https://www.hinkleycenter.org/about/the-research-selection-process/>

# NSF INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH CENTERS (NSF I/UCRCS)

[*https://www.eng.ufl.edu/research/centers-institutes/*](https://www.eng.ufl.edu/research/centers-institutes/)

* Center for Cyber-Physical Systems for the Hospital Operating Room (CYBHOR)  • [Principal Investigator’s web page](http://www.bme.ufl.edu/people/berceli_scott)
* [Center for High-Performance Reconfigurable Computing (CHREC)](http://www.chrec.org/)
* [Center for Particulate and Surfactant Systems (CPaSS)](http://cpass.mse.ufl.edu/)
* [Cloud and Autonomic Computing (CAC) Center](http://www.depts.ttu.edu/cac/)
* [Consortium for Nuclear Forensics](https://www.nuclearforensicsconsortium.org/)
* [Multi-functional Integrated System Technology (MIST) Center](http://www.mist-center.org/)
* NSF Center for Big Learning (CBL)