UF Florida Institute for National Security
UNIVERSITY of FLORIDA

The Florida Institute for National Security (FINS)

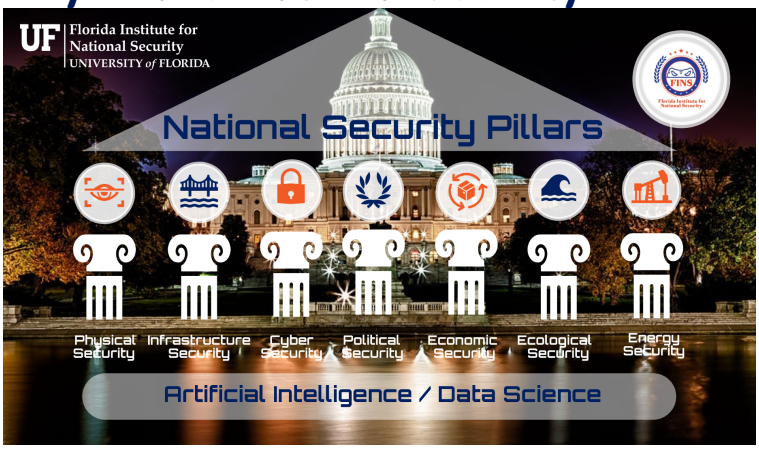
The nation's leading hub for the development of applied Artificial Intelligence (AI) & data science based solutions, innovation, research & talent in support of national security.

The Florida Institute for National Security (FINS) is an interdisciplinary, cross-curricular entity that is galvanizing the robust research, education, and professional development efforts in Artificial Intelligence (AI) already underway at the University of Florida (UF) towards the development of deployable, applied AI & data science-based solutions to the most prevailing national security challenges.

FINS emerges in support of the UF's AI Initiative, which aims to: build an AI University; make UF a leader in AI research and development; and, thus, play a crucial role in the transformation of Florida's economy into a technology-driven, high-wage economy by implementing integration of AI (coursework) Across the Curriculum, as well as up-skilling and professional development opportunities to enable the future workforce to use AI technology to solve pressing challenges across every industry.

FINS extends this mission to the development of deployable, applied AI and data science applications in support of national security concerns such as defense, cybersecurity, ecology, medical informatics, the stability & logistics of our economy, microelectronics, supply-chains, transportation and communication systems.

Why AI and National Security?



Modern society has ventured into the 4th Industrial Revolution (4IR), which is characterized by emerging technologies that synthesize the physical, digital, and biological worlds and in which Artificial Intelligence (AI) is a key driver that has catalyzed stunning levels of technological development impacting and transforming all all disciplines, sectors of society, economies, and industries worldwide. A failure to develop, adopt and effectively integrate AI technology poses significant risks to our national security.

As per the Final Report published in March 2021 by The National Security Commission on Artificial Intelligence (NSCAI) - a bipartisan commission of 15 technologists, national security professionals, business executives, and academic leaders -

- "The human talent deficit is the government's most conspicuous AI deficit and the single greatest inhibitor to buying, building, and fielding AI-enabled technologies for national security purposes."
- The US government must dramatically invest in AI talent pipelines in order to remain at the forefront of AI now and into the future."
- "The domestic AI talent pipeline is not keeping up with government and industry needs."

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Why Florida?

FINS is uniquely situated in a state that plays a critical role in all matters of national security as Florida is home to many key commands and government and industrial organizations focused on defense and intelligence.

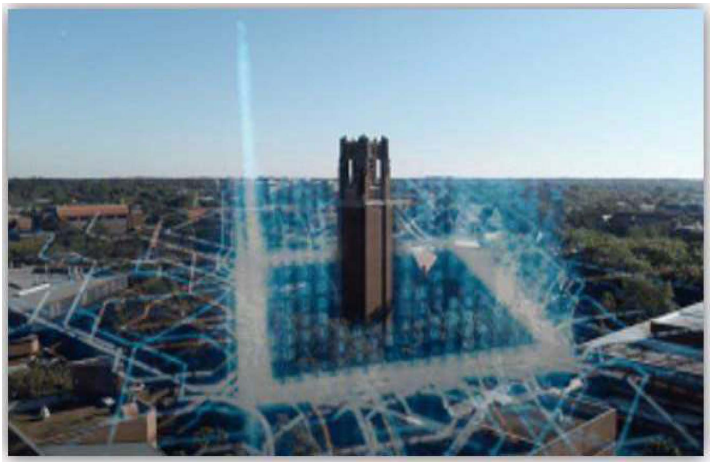
In addition, Florida is often ground zero for national security matters such as illegal drug importation & interdiction, illegal immigration, and ecological concerns such as sea-level rise.

Hence, FINS' proximity to these security and defense stakeholders provides an advantageous opportunity to draw from and contribute to nationwide talent pools, as well as to lead the way in promoting the deployment of new AI technologies in support of national security.

Why UF FINS?

Just as FINS is situated within a state that plays a role in overseeing crucial national security operations and resources, it is also advantageously based within of one of the nation's leading research institutions, whose current AI-infrastructure already enables it to emerge as a leader in AI /datascience research, development, and education.

Further, in accordance with **FINS' Mission and Vision Statements**, the institute fully intends to leverage the arsenal or resources afforded by UF and its standing among the **Top 5 Public Universities in the U.S.** towards establishing Florida as a nationally recognized, premier hub for AI innovation, talent and workforce development in support of national security.



UF FINS is poised to lead the nation in applied AI for national security.

FINS is buttressed in doing so by the following:

- Established in 2012, FINS is the first academic institution in the state of Florida focused on national security.
- UF is the **first university to establish a Cooperative Research & Development Agreement (CRADA) with CIA Labs**, providing potential direct connections with UF graduates and the intelligence sector.
- UF also has extensive research relationships with many government agencies that are involved with national security matters, such as the NOAA, NASA, DoD, Forestry Service, USGS, USDA.
- UF is one of only 17 institutions nation-wide to carry the triple designation of land, sea, and space-grant university and is the only institution in Florida to hold that distinction.

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Why UF FINS

- UF is home to HiPerGator AI 3.0, which is designed specifically for AI development and is noted for being the most powerful supercomputer for AI research in Florida, the most powerful university supercomputer in the southern US, and the third-fastest university supercomputer in the country. (Forbes, 2021)
- Given the world-leading caliber of research which UF produces across disciplines through its institutes, programs, and departments, FINS provides the opportunity to develop a cohesive focal point at UF for advancements in the arena of AI and national security matters.
- UF has 300+ faculty across campus conducting applied AI research in various disciplines.
- FINS has a proven track record of providing innovative and effective solutions to federal stakeholders.
- UF's business incubator, ***UF Innovate***, which is ranked 1st among US public universities in tech-transfer for economic return (**Heartland Forward, 2022**), will advance transitioning new AI and data science technologies from academic labs into the government and public sectors.
- FINS's sponsoring college, the **Herbert Wertheim College of Engineering (HWCOE)** is home to:
  - The **Electronic Delivery of Gator Engineering (EDGE) Program,** which delivers **on-line** (for credit and non-credit) **offerings** to up-skill citizens, including many AI-based offerings, such as an **Undergraduate AI Certificate, a Graduate Machine Learning Certificate, short courses for engineers,** and **AI credentials/micro-credentials.**
  - The UF founded ***Engineering National Graduate Institutional Exchange (ENGINE) Consortium***, which provides an avenue for showcasing the nation's best and brightest undergraduate engineers and recruiting them for graduate school and other academic endeavors, will greatly enhance workforce development and new talent acquisition initiatives.
- UF's significant veteran student population is potential source of talent capable of performing restricted research.

FINS Talent Pipeline (FTP)

Mission:

The FINS *Talent Pipeline* (FTP) program aims to produce a diverse, multidisciplinary talent pool of Artificial Intelligence (AI) and data science-knowledgeable graduates who are interested in working on prevailing national security (NS) challenges and seeks to establish a direct pipeline between these individuals and employers serving the defense and intelligence communities.

Vision:

- Leverage the University of Florida's (UF) *AI Initiative* to provide education and training to both students and current members of the NS workforce to reduce the national human talent deficit in AI -"the single greatest inhibitor to buying, building, and fielding AI-enabled technologies for national security". (NSCAI, Final Report, 2022)
- Prepare cohorts of participants from various Science, Technology, Engineering & Math (STEM) and Humanities disciplines to specialize in developing and applying AI and data science-based solutions to pressing NS-related topics within their fields and transfer academic research insights into AI-enabled NS solutions.

Acceptance Criteria:

- Undergraduates with over one year of study in a STEM-related field. (Sophomore or Junior at program start date.)
- U.S. citizenship.
- Sustained minimum of 3.5 rounded GPA.

Program Description:

FTP is currently a pilot seeded by funding from the Office of the President of UF. Participants cultivate experience in AI and data science related research, are involved in monthly self-development and mentorship seminars to enhance soft skills and resumes, and participate in networking events with defense and intelligence community employers and stakeholders.

1. Research

Participants gain experience through paid involvement in AI, data science and defense-related research by aiding researchers in addressing current, real-world problems related to NS from 5-10 hours a week.

2. Mentorship

Participants are guided by faculty mentors when conducting their research, learning from their knowledgebase, and polishing their own professional skills.

3. Networking

Participants are provided with opportunities to make and leverage contacts in both government and industry to create their own professional and diverse network to raise their own profile and expand their access to unique opportunities. FINS will also assist participants in acquiring paid summer internships.

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ABOUT US

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NAICS ID: 541330, 541512, 541715, 541720, 611310, 611420

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RESEARCH CAPABILITIES & DOMAINS

FINS utilizes its expertise in data science and AI-based capabilities and broad pool of subject matter experts to develop solutions focusing on four key AI specialties - Automation, Prediction, Planning & Evaluation - towards addressing and mitigating concerns in areas of national security across several critical domains.

Research Capabilities:

- Computer Vision & Image Processing
- Computational Behavioral Analytics
- Data Augmentation & Generation
- Data-centric AI
- Explainable AI
- Natural Language Processing
- Deep Learning
- Machine Learning
- Reinforcement Learning
- AI Integration with Control Theory & Formal Methods
- Trustworthy AI

Research Domains:

- Defense
- Multi-domain Intelligence (C6ISR)
- AI-related Law, Policy & Ethics
- Agriculture
- Border Control
- Cybersecurity
- Critical Infrastructure
- Economy
- Microelectronics Security
- Medical Informatics
- Supply Chain Stability/Logistics
- Psychology
- Nuclear proliferation

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DIFFERENTIATORS

- **Cutting-edge Computer Infrastructure:**
  ***HiPerGator 3.0 AI:**
  - ✓ The fastest (and most energy efficient) AI-Enabled supercomputer in higher education
  - ✓ Powered by NVIDIA GPUS and Intel cores, with the latest generation of processors
  - ✓ Boasts speeds of 13.75 petaflops per second
  - ✓ Available to all FINS collaborators from industry and government

- **Comprehensive Applied AI Expertise:**
  - ✓ Academic ecosystem of 160+ subject specific **institutes** & **centers**
  - ✓ 300+ faculty conducting AI research working towards shared research across unclassified/ classified networks

- **Restricted Research Capability:**
  - ✓ Experience with providing innovative and robust solutions to government stakeholders.

- **Technology Transfer:**
  ***UF Innovate**,
  - ✓ UF's business incubator, is **ranked 1st in the nation** among public universities for moving new discoveries from the lab into the real world through research commercialization, technology transfer, and STEM graduates
  - ✓ FINS has a broad portfolio of disruptive technologies with 20+ patents and more pending invention disclosures & applications

- **Education & Workforce Development:**
  - ✓ Electronic Delivery of Gator Engineering (**EDGE**) Platform,
  - ✓ Delivers on-line courses and up-skilling opportunities ranging from short courses and AI Micro-credentials & Credentials to Certificates and Master's degrees
  - ✓ UF-based Engineering National Graduate Institutional Exchange (**ENGINE**) Consortium, provides access to nation's best and brightest undergraduate engineers – includes > 17.000 students from ~85 institutions

PAST PERFORMANCE

FINS faculty and students have completed research projects with the following sponsors:

- Air Force Research Laboratory (**AFRL**)
- Air Force Office of Scientific Research (**AFOSR**)
- Defense Advanced Research Projects Agency (**DARPA**)
- Intelligence Advanced Research Projects Agency (**IARPA**)
- National Institute of Standards & Technology (**NIST**)
- Office For Naval Research (**ONR**)
- Others