

TRIUMPH GULF COAST, INC. PRE-APPLICATION FORM

Triumph Gulf Coast, Inc. (“Triumph Gulf Coast”) has created a pre-application process to provide initial consideration of eligibility for potential ideas of projects or programs that may seek an award of funding. Applicants are required to participate in the pre-application process. Notwithstanding the response from Triumph Gulf Coast on the pre-application form, an Applicant may still elect to submit an Application.

APPLICANT INFORMATION

Name of Individual/Entity/Organization: Florida Institute of Human & Machine Cognition, Inc.

Proposal Title: National Center for Collaborative Autonomy (NCCA)

Amount of Triumph Funds Requested: \$6.3MM

Total Estimated Project Cost: \$24.3MM

Brief Description of Individual/Entity/Organization:

The Florida Institute for Human & Machine Cognition (IHMC) is a world-renowned research institute located in Pensacola working in the areas of artificial intelligence, cyber security, exoskeleton development, robotics, assistive technologies, natural language understanding, data mining, and other related high technology fields. A 501(c)3 statewide research institute created pursuant to Section 1004.447 F.S., IHMC is part of the State University System of Florida with formal research affiliations with many Universities and independent research institutions. Among others, IHMC’s federal research clients and research partners include NASA, Army, Navy, Air Force, DARPA, and IARPA.

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Proposed Project: Building on Success - IHMC plans to build on its exceptional success to date leveraging Triumph Gulf Coast funding to drive the next transformational program in the region. With the support of Triumph funding, we have already succeeded in bringing significant amounts of **new** external funding to the area, enabling IHMC to remain ahead of schedule for its match requirements. This effort has not only accelerated our progress but has also allowed us to create 30 new high-wage jobs, further contributing to the economic growth of our community. Moreover, our team has been highly efficient in managing our personnel budget, swiftly integrating new HRP resources into funded projects. This efficiency has allowed us to maximize the impact of the Triumph funding, extending its benefits and reinforcing our commitment to advancing innovation and opportunity in our region. We are eager to continue building on this momentum and driving forward our mission to make a lasting positive impact.

National Center for Collaborative Autonomy (NCCA): The estimated market value for aerial drones in 2023 was US\$15,364 million and it is expected to grow to US\$91,304 million by the end of

2033 with a compound annual growth rate of 19.3%¹. Autonomous maritime systems are also seeing increased investment: autonomous underwater systems are a US\$3,420 million market with a growth rate of 15.6%², and autonomous surface vehicles are a US\$2,160 million market with a growth rate of 4.7%³. Commercial interest in developing and deploying autonomous platforms and systems is at an all-time high. However, to achieve meaningful success using autonomous systems requires that we move away from the current model of individual interaction. For example, currently each drone is flown by one pilot – this is simply not scalable. The vision for the future demands that these multitude of autonomous platforms must be able to coordinate and collaborate with each other as well as with humans – we need collaborative autonomy.

IHMC proposes to establish a National Center for Collaborative Autonomy (NCCA). In the context of this proposal, Collaborative Autonomy refers to autonomous platforms operating in multiple domains such as maritime (surface, underwater), ground, air, and space while operating with limited human input that still provides valuable oversight. IHMC is focused on its goal to advance collaborative autonomy, and to develop methods for human operators to guide the systems and ensure their safe and effective operation.

NCCA will establish and support multiple areas of research, including multi-domain collaborative autonomous systems, robust communication and networking techniques, collaborative manipulation, distributed artificial intelligence, machine learning techniques for multiple distributed autonomous systems, and human-machine teaming strategies for heterogeneous autonomous systems.

The research to be conducted by NCCA will also be of keen interest to the federal government in general, and to the US military in particular. As observed in recent conflicts, unmanned systems in general and drones in particular, are transforming modern warfare. The ability for inexpensive drones to disable and/or destroy expensive equipment is creating a stark asymmetry, one that will be amplified by collaborative autonomy. Indeed, the ability to scale up an operator's ability to utilize not 1, but 10s, if not 100s of autonomous platforms simultaneously to fight an adversary will vastly improve our effectiveness in war. For this reason alone, across the federal government, arguably, one of the most important and needed research areas is collaborative autonomy. We expect that establishing NCCA will result in many funding opportunities with the federal government (and with the commercial sector) that currently are not tapped into by the northwest Florida region. Given the demonstrated importance of autonomous platforms in modern and future warfare, NCCA will position IHMC to serve the defense and industrial priorities of not just Northwest Florida, but the United States as a whole.

Capabilities developed at NCCA could help mitigate the natural disasters that threaten to disrupt the economy of Northwest Florida. For example, teams of autonomous systems could quickly survey damage after a natural disaster and direct relief efforts or help locate missing assets. Autonomous teams could rapidly inspect damage to infrastructure such as bridges and direct repair efforts. Investing in the development of the autonomous systems developed at NCCA can help harden Northwest Florida's economy against the natural disasters of the future.

Furthermore, Northwest Florida is uniquely positioned to conduct research in Collaborative Autonomy. Our proximity to not just the Gulf of Mexico, but the variety of water bodies (bay, sound, bayou), our history in naval aviation, and the robust military presence with the Air Force Research

¹ <https://www.factmr.com/report/autonomous-drone-market>

² [Autonomous Underwater Vehicle Market Size & Share | By 2034 \(factmr.com\)](#)

³ [Unmanned Surface Vehicle \[USV\] Market | Global Report, 2032 \(fortunebusinessinsights.com\)](#)

Laboratory at Eglin, Special Operations Command at Hurlburt Field, and the Navy Surface Warfare Center in Panama City make this a unique and arguably the best suited location to conduct this research in collaborative autonomy – hitting all of the domains of Air, Space, Sea, and Land.

IHMC will leverage the geographic features of Northwest Florida to perform one-of-a-kind research on multi-domain collaborative autonomous systems. The artificial reef at Park East, the U.S.S. Oriskanny, the Joe Patti Barge, and other underwater sites provide rich features for testing navigation and perception algorithms on water-surface and underwater autonomous systems. Littoral environments around Pensacola allow testing autonomous teams of all domains: ground, underwater, water surface, and aerial working in conjunction. The bayous provide calm water for water-surface robots and their low visibility can allow stress testing of perception and navigation of underwater robots. These unique geographic assets will allow NCCA's work on collaborative autonomy to have significant national impact.

NCCA will catalyze the development of a robust ecosystem of industrial innovation in collaborative maritime and land-based autonomy in Northwest Florida through collaborations with local entrepreneurial entities, including CO:Lab and TechFarm Capital. NCCA will facilitate access to additional funding opportunities targeted to small businesses, which commonly require significant existing equipment to be in place. Possible collaboration for robot hardware design could be through Boardwalk Robotics, an IHMC spin-out company already tightly integrated with IHMC. Prior collaboration with the Pensacola Police Department and Santa Rosa SWAT show that regional entities can be strengthened by integrating robotic systems developed through NCCA.

IHMC is internationally recognized in three distinct fields of research prominence: Robotics, Artificial Intelligence, and Healthspan, Resilience, and Performance. The envisioned NCCA will combine two of IHMC's research focus areas: Robotics and Artificial Intelligence. Scaling IHMC's robotics research to large, multi-domain collaborating autonomous teams will strengthen IHMC's position as a leader in robotics and AI research. NCCA will leverage advances in both areas to spearhead the next generation of advancement provided by collaborative autonomy.

IHMC's partnership with UWF to offer the Intelligent Systems and Robotics program allows a seamless talent recruitment and development pipeline. Unique outreach activities will connect with the broader public and drive recruitment efforts. Through this infrastructure, NCCA will support the economy by adding high earning jobs and bringing into Northwest Florida new federal funding for this increasingly important area of research.

NCCA research and associated technologies involve the incorporation of export-controlled technologies and Federally designated "Controlled Unclassified Information (CUI)." The CUI designation is an unclassified handling control aimed at preventing the loss of information which does not meet the requirement to be classified but which is valuable to the security goals of the United States Government. Recent Federal laws and regulations have strengthened the logical controls placed on CUI and export-controlled information within IT systems. These controls have developed into a Cyber Maturity Model Certification (CMMC) requirement. Obtaining this certification requires significant re-tooling and acquisition of services not currently in place at IHMC.

As a critical component of this project, IHMC proposes to develop a CMMC qualified IT solution to directly support the sensitive NCCA research throughout its development. This solution includes the use of Microsoft's compliant and scalable Government Commercial Cloud (GCC) services. GCC serves as the backbone of a CMMC compliant enclave within our IT design providing a ready-built cloud-based solution for the secure storage, transmission and processing of CUI data. IHMC intends to abide by these requirements to better serve our end users and Federal customers.

Amount of funds being sought from Triumph Gulf Coast: \$6.3MM

The budget for this proposal is \$6.3MM, which includes purchasing equipment that will enable IHMC to jumpstart research in Collaborative Autonomy and to cover labor for hiring new PIs and other critical staff to expand and accelerate research in this area.

Amount and identity of other sources of funds for the 10 year duration of the proposed effort:

NCCA will enable significant new grant funding to flow into IHMC from diverse government programs. Over the 10-year program duration, NCCA will become a self-sustaining research unit through federal grants and corporate research sponsorships at IHMC. In the interim, IHMC will provide support for the program along with Triumph Gulf Coast. We anticipate more than \$18M in external funding that will be enabled by this project.

Anticipated Location of the project or program: The project will reside primarily in Escambia County however, IHMC anticipates significant impact and collaboration with both Santa Rosa County and Bay County.

Summary description of the proposed program, including how the program will be transformational and promote economic recovery, diversification, and enhancement of the disproportionately affected counties: The scalability and success of autonomous platforms requires breaking today's limitations of one operator (or sometimes even multiple operators) managing a single platform. This arrangement limits the potential scalability of future systems, constrains the advantages autonomous capabilities are intended to provide, and inhibits the commercial viability of leveraging fleets of autonomous systems. Developing the communication, coordination, and human-teaming technologies that allow large teams of heterogenous autonomous platforms to collaborate will unlock the potential of autonomous systems and position NCCA and Northwest Florida as global leaders having a transformational regional impact.

A summary timeline for the proposed project or program: NCCA will be built over a 10-year period. In the initial phase, Triumph Gulf Coast funds will be used to acquire equipment and supplies and make key hires. In years 4-10 and indefinitely thereafter, funds from IHMC and external funding sources will be used to sustain and grow NCCA.

IMPORTANT NOTICE

This pre-application process will **not** result in an award of funding by Triumph Gulf Coast. Rather, this process is designed to facilitate submission of ideas for potential projects or programs before the Applicant expends time and/or resources to complete a full Application. All Applicants for funding are required to complete an Application, which will be reviewed and then considered for award at the discretion of Triumph Gulf Coast Board.

Please Select the Proposal's Eligibility Category(s)

Pursuant to Section 288.8017, Triumph Gulf Coast, Inc. was created to make awards from available funds to projects or programs that meet the priorities for economic recovery, diversification, and enhancement of the disproportionately affected counties. The disproportionately affected counties are: Bay County, Escambia County, Franklin County, Gulf County, Okaloosa County, Santa Rosa County, Walton County, or Wakulla County. *See*, Section 288.08012.

1. From the choices below, please check the box that describes the purpose of the proposed project or program (check all that apply):
 - Ad valorem tax rate reduction within disproportionately affected counties;
 - Local match requirements of s. 288.0655 for projects in the disproportionately affected counties;
 - Public infrastructure projects for construction, expansion, or maintenance which are shown to enhance economic recovery, diversification, and enhancement of the disproportionately affected counties;
 - Grants to local governments in the disproportionately affected counties to establish and maintain equipment and trained personnel for local action plans of response to respond to disasters, such as plans created for the Coastal Impacts Assistance Program;
 - Grants to support programs that prepare students for future occupations and careers at K-20 institutions that have campuses in the disproportionately affected counties. Eligible programs include those that increase students' technology skills and knowledge; encourage industry certifications; provide rigorous, alternative pathways for students to meet high school graduation requirements; strengthen career readiness initiatives; fund high-demand programs of emphasis at the bachelor's and master's level designated by the Board of Governors; and, similar to or the same as talent retention programs created by the Chancellor of the State University System and the Commission of Education, encourage students with interest or aptitude for science, technology, engineering, mathematics, and medical disciplines to pursue postsecondary education at a state university or a Florida College System institution within the disproportionately affected counties;
 - Grants to support programs that provide participants in the disproportionately affected counties with transferable, sustainable workforce skills that are not confined to a single employer; and
 - Grants to the tourism entity created under s. 288.1226 for the purpose of advertising and promoting tourism and Fresh From Florida, and grants to promote workforce and infrastructure, on behalf of all of the disproportionately affected counties.

Please Select the Priorities this Proposal's Outcomes will Achieve

1. Please check the box if the proposed project or program will meet any of the following priorities (check all that apply):
- Generate maximum estimated economic benefits, based on tools and models not generally employed by economic input-output analyses, including cost-benefit, return-on-investment, or dynamic scoring techniques to determine how the long-term economic growth potential of the disproportionately affected counties may be enhanced by the investment.
 - Increase household income in the disproportionately affected counties above national average household income.
 - Leverage or further enhance key regional assets, including educational institutions, research facilities, and military bases.
 - Partner with local governments to provide funds, infrastructure, land, or other assistance for the project.
 - Benefit the environment, in addition to the economy.
 - Provide outcome measures.
 - Partner with K-20 educational institutions or school districts located within the disproportionately affected counties as of January 1, 2017.
 - Are recommended by the board of county commissioners of the county in which the project or program will be located.
 - Partner with convention and visitor bureaus, tourist development councils, or chambers of commerce located within the disproportionately affected counties.