



**THIS IS NOT
AN ORDER**

REQUEST FOR BIDS/PROPOSALS COVERSHEET
THE UNIVERSITY OF SOUTHERN MISSISSIPPI
Procurement and Contract Services
118 College Drive #5003, Hattiesburg, Mississippi 39406-0001

Date: September 24, 2024

BID No. 25-14

THE UNIVERSITY OF SOUTHERN MISSISSIPPI is considering the purchase of the following item(s). We ask that you submit your bid and retain one copy for your files. Right is reserved to accept or reject any part of your bid. Your quotation will be given consideration if received in Bond Hall, Room 214 on or before:
2:00 p.m. CT

October 9, 2024

Buyer: Amber Floyd

Name: _____

Company: _____

Address: _____

City/State/Zip: _____

TERMS - Bidder should state terms of sale. Our terms are 2% ten days, net 45 days.

These terms will apply per Mississippi law.

AWARDING CONTRACT - Cash terms will not be used as a basis for awarding contracts; however, the University will accept cash discounts when earned.

NOTE: If you cannot quote on the exact material shown, please indicate any exception giving brand name and complete specifications of any alternate. If additional space is required, use a separate sheet or letter of transmittal.

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL NET PRICE
		<p>BID 25-14 Trusted Autonomy Portal</p> <p>RFx # 3160006929</p> <p>PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. RFP NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.</p>		

We quote you as above - F.O.B. The University of Southern Mississippi.
Shipment can be made in _____ days from receipt of order. DATE _____
Return quotation to Procurement Services at above address.

Signature Required _____

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI
PROCUREMENT SERVICES
118 COLLEGE DRIVE
#5003
HATTIESBURG, MS 39406-0001**

GENERAL TERMS, CONDITIONS AND INSTRUCTIONS FOR BIDS/PROPOSALS

- 1.) Failure to examine any drawings, specifications, and instructions will be at bidder's risk.
- 2.) Samples of items when called for must be furnished free of expense and if not destroyed in testing, will, upon request, be returned at the bidder's expense. Request for the return of samples must be made within ten (10) days following opening bids. Each individual sample must be labeled with bidder's name and manufacturer's brand name and number.
- 3.) Bids must be signed and sealed with bidder's name and address on the outside of the envelope, and the time and date of the bid opening and the bid file number shown in the lower-left corner of the packages; envelopes, express mailing labels, boxes, etc.
- 4.) At least one (1) signed original and one (1) signed copy of the bid **MUST** be provided. The University **requires** a portable electronic virus/malware free copy (thumb drive) of the bid response from the responding Vendor to be included in the bid response package. If an electronic copy is not included, the University reserves the right to request an electronic copy of the **exact** bid response prior to review of the bid.
- 5.) For your bid to be considered, it must be received, and time stamped in our office by 2:00 P.M. of the bid opening date. It is the responsibility of the vendor to ensure their bid is received within the appointed time. If your bid package is not received in Bond Hall, Room 214, by 2:00 P.M. of the bid opening date, it will not be considered.
 - a. If you are delivering your bid, you need to hand carry the bid package to: The University of Southern Mississippi
Procurement Services
Bond Hall, Room 214
Hattiesburg, Mississippi
 - b. If you are mailing your bid package via U.S. Postal Service, mail to: The University of Southern Mississippi
Procurement Services
118 College Drive #5003
Hattiesburg, MS 39406-0001
 - c. If you are express mailing your bid package via Federal Express or UPS, or any other delivery service which requires the use of a physical address, deliver to:

The University of Southern Mississippi
Receiving Department
2609 West 4th Street
Hattiesburg, MS 39401

- 6.) Bids or proposals shall not be modified, corrected, altered, or amended after the specified closing time and the opening of such bids, unless otherwise noted in the request for bids or proposals.
- 7.) The University of Southern Mississippi reserves the right to reject any and all bids, to waive any informality in bids, and unless otherwise specified by the bidders, to accept any items on the bid. If the bidder fails to state the time within which bids must be accepted, it is understood and agreed that The University of Southern Mississippi shall have 90 days to accept. The University of Southern Mississippi reserves the right to make an award to this bid on an all or none basis, or on a line-by-line basis, whichever serves the best interest of The University of Southern Mississippi.
- 8.) Contracts and purchases will be made or entered into with the lowest, responsible bidder meeting specifications.
- 9.) A written purchase order or contract award mailed or otherwise furnished to the successful bidder within the time of acceptance specified in the Invitation for Bid results in a binding contract without further action by either party. The contract shall not be assignable by the vendor in whole or in part without the written consent of The University of Southern Mississippi.
- 10.) Unless written exception is provided in the bid response, the winning Vendor agrees to be bound by the USM Terms and Conditions, which are incorporated herein, and may be found at <https://www.usm.edu/procurement-contract-services/usm-terms-and-conditions>.
- 11.) Respondents are required to comply with all applicable local, State and Federal laws, codes, ordinances, and regulations in the provision of the materials required.
- 12.) Respondents must comply with Personally Identifiable Information (PII) data protection regarding State, Federal, and University regulations and policies.
- 13.) Mandatory Legal Provisions
 - a. Any provisions disclaiming implied warranties shall be null and void. See Mississippi Code Annotated Sections 11-7-18 and 75-2-719(4). The Vendor shall not disclaim the implied warranties of merchantability and fitness for a particular purpose.
 - b. The Vendor shall have no limitation on liability for claims related to the following items:
 - i. Infringement issues;
 - ii. Bodily injury;
 - iii. Death;
 - iv. Physical damage to tangible personal and/or real property; and/or

- c. The intentional and willful misconduct or negligent acts of the Vendor and/or Vendor's employees or subcontractors.
 - d. All requirements that the University pay interest are deleted, except for those in conjunction with USM's standard payment terms of Net 45 days. Payments made beyond 45 days are subject to late fees and interest.
 - e. Should any of the terms and conditions in the purchase contract conflict with the laws of the State of Mississippi, the laws of the State of Mississippi shall supersede and govern. A revision of the terms and conditions will be required to ensure compliance with Mississippi state law.
 - f. The University shall not pay any attorney's fees, prejudgment interest or costs associated with any legal action to or for the Vendor, except that which are ordered by a court of competent jurisdiction.
- 14.) Bid files may be examined during normal working hours by bid participants. Non- participants will be prohibited from obtaining any information relative to the bid until the official award has been made.
- 15.) If purchase orders or contracts are canceled because of the awarded vendor's failure to perform or request for price increase, that vendor shall be removed from our bidders'list for a period of 24 months.
- 16.) No addendum will be issued within a period of two (2) working days prior to the time and date set for the bid opening. Should it become necessary to issue an addendum within the two-day period prior to the bid opening, the bid date will be reset giving bidders ample time to answer the addendum.
- 17.) Alternate bids, unless specifically requested or allowed, will not be considered.
- 18.) Bid openings will be conducted open to the public. However, they will serve only to open the bids. No discussion will be held with any vendor as to the quality or provisions of the specifications, and no award will be made either stated or implied at the bid opening. After the close of the bid opening meeting, the bids will be considered to be in the evaluation process and will not be available for review by bidders. Proposal openings are not required to be open to the public; however, the resulting award is open for public inspection.
- 19.) Prices quoted shall be firm for the term of the contract or for the stated time of acceptance.
- 20.) The bidder understands that The University of Southern Mississippi is an equal opportunity employer and, therefore, maintains a policy which prohibits unlawful discrimination based on race, color, creed, sex, age, national origin, physical handicap, disability, or any other such discrimination; and the bidder, by signing this bid, agrees during the term of agreement that the bidder will strictly adhere to this policy in its employment practices and provision of products or services.
- 21.) Bidders must upon request of The University of Southern Mississippi furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. The University of Southern

Mississippi reserves the right to make the final determination as to the bidder's ability.

- 22.) Questions or problems arising from bid procedures should be directed to the Buyer listed on the solicitation at:

The University of Southern Mississippi
118 College Drive #5003
Hattiesburg, MS 39406-0001
Phone: (601) 266-4131
Bids@usm.edu

- 23.) All items must equal or exceed the specifications listed. The absence of detailed specifications or the omission of detailed description shall be recognized as meaning that only the best commercial practices are to prevail, and that only first quality materials and workmanship are to be used.
- 24.) It is the intent of the specifications to obtain a product that will adequately meet the needs of the user while promoting the greatest extent of competition that is practicable. It is the responsibility of the prospective bidder to review the entire Invitation to Bid packet and to notify The University of Southern Mississippi if the Specifications, Instructions, General, or Special Conditions are formulated in a manner which would unnecessarily restrict competition.
- 25.) It shall be incumbent upon the bidders to understand the specifications. Any requests for clarifications shall be in writing and shall be submitted to our Procurement Services office at least seven (7) business days prior to the time and date set for the bid opening, unless otherwise noted in the bid or proposal specifications.
- 26.) The minimum specifications are used to set a standard and in no case are used with the intention of discriminating against any manufacturer. Bidders should note the name and the manufacturer and model number of the product they propose to furnish and submit descriptive literature.
- 27.) Trade names, brand names, and/or manufacturer's information used in these specifications are for the purpose of establishing quality, unless otherwise noted. Bids on products of other qualified manufacturers are acceptable, provided they are demonstrated as equal to those specified in construction, design and suitability. Each bidder shall submit with his bid a complete brochure with pictures on each item and shall point out specifically any deviations from the specified items. Failure to do so may disqualify any bid. Please bid as specified or an approved equal.
- 28.) A copy of the manufacturer's standard guarantee/warranty shall accompany and become a part of this bid.
- 29.) There are no federal or state laws that prohibit bidders from submitting a bid lower than a price or bid given to the U.S. Government. Bidders may bid lower than U.S. Government contract price without any liability as The University of

Southern Mississippi is exempt from the provisions of the Robinson-Patman Act and other related laws. In addition, the U.S. Government has no provisions in any of its purchasing arrangements with bidders whereby a lower price to The University of Southern Mississippi must automatically be given to the U.S. Government.

- 30.) All invoices, unless noted otherwise, are to be billed to:

The University of Southern Mississippi
IT Invoices
118 College Drive #5181
Hattiesburg, MS 39406-0001
ITInvoices@usm.edu

- 31.) All equipment bids shall be of current production and of the latest design and construction.
- 32.) Where all, or part(s), of the bid is requested on a unit price basis, both the unit prices and the extension of the unit prices constitute a basis of determining the lowest responsible and responsive bidder. In cases of error in the extension of price, the unit price will govern.
- 33.) Should the University of Southern Mississippi close due to inclement weather conditions, or any other unforeseen events on the bid opening date, sealed bids will open the following business day at the same time and location.
- 34.) As an alternative to traditional sealed bids in envelopes, the University of Southern Mississippi is capable of receiving electronic bid responses. While this option is available, it is not required, and we ask that all potential respondents keep in mind that with any electronic system there could be delays or glitches with the submission process; therefore, the University highly encourages traditional sealed bids which are either mailed or submitted in person. Should a vendor choose to submit their response electronically, please follow the instructions below using the following website:
https://www.ms.gov/dfa/contract_bid_search/Home/Sell. On this site you will find helpful links to procurement opportunities, as well as a link to supplier registration. If not already registered in this system, potential bidders will first need to click on 'Supplier Registration' and follow the steps outlined (a one-time process). Once registered, they can return to the original website and click on 'Procurement Opportunities' where they can either search by keyword for the bid they desire to respond to or leave the search box blank and click 'Search' for a listing of all current bids and proposals for the various State of Mississippi offices.

Regarding construction bids, there is one additional step required during the bid submission process. Along with the bid response and other attachments, contractors will also need to attach their Certificate of Responsibility (COR), or a statement that the bid enclosed does not exceed Fifty Thousand Dollars (\$ 50,000.00). If their COR or such statement is not attached, the bid will be invalid and not considered.

AA/EOE/ADA



THE UNIVERSITY OF
SOUTHERN
MISSISSIPPI

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**Specifications for an Ocean Enterprise Trusted Autonomy
Portal (Hardware and Software)**

The University of Southern Mississippi

Prepared by Steve Stanic and Landry Bernard

Sept 18/2024

Specifications for an Ocean Enterprise Trusted Autonomy Portal (Hardware and Software)

I. Purpose

This RFP document outlines the specifications for a Trusted Autonomy Portal (TAP). The portal system shall utilize state-of-the-art technologies, including AI, machine learning, simulation engines, blockchain, existing maritime systems, and models. The system will include both hardware (high-performance laptops/desktops, IoT devices) and software (AI models, simulation tools, data integration systems) components. The scope of the project includes the design, development, testing, and deployment of the TAP.

II. Background

This document defines the requirements for the development and deployment of an Ocean Enterprises Trusted Autonomy Portal. It shall support real-time data ingestion, AI-driven simulations, blockchain for data integrity, and be deployable on high-end laptops or desktops for field operations. The TAP is intended for maritime research, autonomous vessel testing, and decision-making applications, adhering to strict security standards and delivering robust performance in varied environments. The TAP should provide scalable, secure, and efficient solutions for handling maritime autonomy scenarios, integrating advanced oceanographic models, and processing real-time data from sensors and IoT devices. The system shall comply with all relevant maritime data standards for vessel tracking, navigation, simulation, DoD standards for security, encryption, and data management.

III. Specific Functional Specifications and Requirements

<p>Real-Time Data Ingestion and Processing</p> <ul style="list-style-type: none">- The system shall be capable of ingesting real-time data from maritime sensors, autonomous vessels, IoT devices, and environmental monitoring systems.- Data shall include but is not limited to vessel position, speed, heading, and telemetry.- Environmental data such as water temperature, wind speed, wave height, and obstacles shall also be available. <p>Ingestion Protocols</p> <ul style="list-style-type: none">- The system shall support data ingestion via MQTT, Kafka, WebSocket, and REST APIs. <p>Data Handling</p> <ul style="list-style-type: none">- The system shall normalize and clean incoming data streams to ensure consistency across all simulation scenarios.	<p>Integration with Existing Models</p> <ul style="list-style-type: none">- The TAP shall provide AI-driven simulations of maritime scenarios. The AI shall also predict vessel behaviors, optimize collision avoidance strategies, and simulate environmental interactions. <p>Integration with Existing Models</p> <ul style="list-style-type: none">- Bellhop 2D/3D Models: Simulate sound propagation and underwater acoustic scenarios.- NGOFS2/HYCOM Models: Simulate Gulf of Mexico conditions, including hydrodynamic, current, and wave models.- USM's Hi-Res Coastal Models: For high-resolution coastal and port simulations.- AI Models: Shall support ONNX-based models for performance optimization on the target hardware.- Simulation Tools: These tools shall support integration with tools for real-time 3D vessel behavior modeling and environmental simulation.
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Edge Computing Deployment

- The TAP shall support deployment on high-performance laptops/desktops allowing for field-based use. Some features may be cloud based.
- **Laptop Specifications:** High-end laptops with dedicated GPUs, supporting both Windows and Linux shall be provided.
- **On-Device AI Inference:** Only ONNX and TinyML shall be used to optimize AI model inference on devices with limited resources.
- **Scalability:** The system shall be capable of scaling from local deployment on a single laptop to a cloud-based environment for more extensive simulations.

Blockchain for Data Integrity

- A blockchain-based data logging mechanism shall be implemented to ensure the integrity and traceability of simulation data and AI model retraining. This shall include the use of:
 - **Micro-Blockchain:** blockchain technology and smart contracts shall be utilized to log each interaction, simulation run, and AI updates.
 - **Smart Contracts:** Shall be used for automation of model retraining, data verification, and logging processes.
 - **Compliance:** Ensure blockchain implementation adheres to DoD data integrity and cybersecurity standards.

SME Tools for AI Model Creation

- The vendor shall provide user-friendly tools for Subject Matter Experts (SMEs) to create, update, and deploy AI models within the simulation environment. This includes the following:
 - **Jupyter Notebook Integration:** Allow SMEs to interact with AI models and datasets using Jupyter Notebooks.
 - **Python Libraries:** Provide access to common libraries such as TensorFlow, PyTorch, SciPy, and Xarray for model development and data analysis.
 - **Model Deployment:** SMEs shall be able to deploy their AI models to the simulation environment without requiring in-depth technical knowledge.

Secure Data Management

- Ensure that all data within the TAP is securely managed, stored, and transmitted. This shall include the following:
 - **Encryption:** End-to-end encryption of all data streams and stored data.
 - **Role-Based Access Control:** Implement Role-Based Access Control (RBAC) to manage user permissions, ensuring that only authorized users can access sensitive data or make changes to AI models.
 - **Active Directory Integration:** Support integration with Microsoft Active Directory for authentication and access management.

IV. Specific Non-Functional Specifications and Requirements

Performance

- **Latency:** The system shall process real-time data with a latency of no more than 1000ms.
- **Throughput:** There shall be Support for at least 50,000 data points per second during ingestion and processing.
- **Simulation Speed:** The system shall run simulations efficiently, handling up to 100 vessels simultaneously in real-time.

Scalability

- **Vertical Scaling:** The system shall scale with the complexity of the simulations, allowing for additional compute resources to be added as needed.
- **Horizontal Scaling:** The system shall support the addition of multiple nodes for cloud-based deployment when scaling beyond single machine processing power.

Usability

- **User Interface:** The system shall provide an intuitive user interface for configuring simulations, monitoring data streams and adjusting AI models.
- **SME-Friendly Tools:** Shall provide non-technical users with the ability to interact with AI models and simulations without requiring coding expertise.

Security

- **Compliance:** The system shall comply with DoD cybersecurity standards, including encryption, secure access control, and data integrity measures.
- **Audit Logging:** A detailed audit log of all actions performed within the system shall be provided, including data access, model changes, and simulation outcomes.

Reliability and Availability

- **Uptime:** The system shall maintain at least 99.9% uptime
- **Disaster Recovery:** The system shall have disaster recovery mechanisms in place, with automatic backups and recovery within 4 hours of an incident.

V. Specific Specifications for Each Laptop Computer

The following minimum specifications that each Laptop Computer shall have to support USM’s project objectives.

Laptop Specifications	
CPU	The CPU shall be an Intel i9 or AMD Ryzen 9 equivalent or better
GPU	The GPU Shall be NVIDIA RTX 3080 or equivalent, capable of handling AI inference workloads
RAM	Shall be at least 32GB
Storage	At least 1TB SSD
Operating System	Shall Support for both Windows 10/11 and macOS (M3 Pro/Max)
Data Sensors	Must support integration with IoT sensors for real-time data collection, including GPS, environmental monitoring, and autonomous vessel telemetry
Connectivity	The system shall support multiple communication protocols for IoT devices, including 5G, Wi-Fi 6, and LoRa

VI. Specific Specifications for Desktop Computers

The following minimum specifications that each Desktop Computer shall have to support USM’s project objectives.

Desktop Specifications	
CPU	The CPU shall be AMD Ryzen Threadripper 5995WX or Intel i9-13900K
GPU	The GPU Shall be NVIDIA RTX 4090 or NVIDIA A100 (for AI/ML workloads)
RAM	Shall be at least 128 GB or 256GB DDR5
Storage	At least 2 TB NVMe SSD (Primary) + 4TB NVMe SSD (Secondary)
Operating System	The operating system shall be Windows 11 Pro / Ubuntu 22.04 LTS
Cooling	The cooling system shall be liquid or high-performance air cooling
PSU	1600W, 80 PLUS Titanium
Motherboard	ASUS ROG Zenith II Extreme Alpha (Threadripper) or ASUS ROG Maximus Z690 Hero (Intel)

VII. Deliverables

The following is a list of specific deliverables but not be limited to only the following:

1. A complete architectural design document detailing how the system integrates all components shall be delivered (AI, blockchain, simulation tools, etc.).
2. High-performance laptops, desktops, and IoT devices shall be delivered.
3. Delivery of the TAP software shall include installation and deployment instructions.
4. Pre-trained AI models for collision avoidance and vessel behavior with documentation for model retraining shall be delivered.
5. A fully functional blockchain-based data logging system shall be delivered.
6. A suite of tools and user documentation for SMEs to interact with the simulation environment and AI models shall be delivered.

7. Performance, scalability, security, and usability testing reports shall be delivered.
8. The delivery arrangements and transportation costs shall be the vendor's responsibility.
9. These Tap systems, software packages, and support equipment shall be delivered to USM's Marine Research Center, 1030 30th Ave Gulfport, MS 39501.

VIII. Training

The vendor shall provide training on the operation, software, maintenance, troubleshooting, and integration of all systems. This training shall take place at the USM facility located in Gulfport MS.

IX. Proof of Performance

The vendor shall provide a detailed technical approach to meet the functional and non-functional requirements outlined in this document. A summary of relevant experience in maritime autonomy, AI, blockchain, and IoT integration and a detailed project timeline with milestones and estimated delivery dates shall be provided. The vendor needs to provide references where their AI systems in a similar configuration as specified above have operated successfully within the last 2 years. The above requested information will assist USM in determining the bidder's capability of meeting these requirements.

X. Warranty Services

At a minimum, the Contractor shall provide software/hardware warranty support for one year from acceptance. Longer warranty periods are preferred. The Vendor shall agree to repair, adjust, and/or replace (as determined by the University to be in its best interest) any defective materials at the Vendor and/or manufacturers' sole cost. The University will incur no costs for service or replacement of materials during the warranty period. The Vendor will be the sole point of contact for warranty issues.