

# Research on the Application of Large Language Models (LLMs) in the Field of Unmanned Aerial Vehicles (UAVs)

We are conducting a survey to understand your experience with large language models (LLMs) in the context of UAV technology. **All questions, except the first four, are multiple-choice. If a question is unclear, feel free to skip it or select "I do not understand this question. This survey is for academic research purposes only. All responses will remain anonymous and will be used solely in accordance with research ethics guidelines.**

\* 表示必填

1. 1.Which of the following fields are you working in? \*

请选择所有适用项。

- ☐ UAVs
- ☐ Robots
- ☐ Large Language Models
- ☐ 其他: \_\_\_\_\_

2. 2.What are your main responsibilities in your field? \*

请选择所有适用项。

- ☐ Hardware Development
- ☐ Software Development
- ☐ Algorithm Development
- ☐ Testing
- ☐ Research
- ☐ 其他: \_\_\_\_\_

3. 3.How many years of experience do you have in this area of responsibility? \*  
(Please give one decimal place)

\_\_\_\_\_

4. 4.What country or region are you currently in? \*

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5. 5.Is your team currently working on a project that integrates large language models with UAVs?

请仅选择一个答案。

- ☐ Yes, fully deployed (Skip to Q7)
- ☐ Yes, in the proof-of-concept phase (Skip to Q7)
- ☐ Plan to try, but not yet implemented (skip to Q6)
- ☐ Interested, but not started (Skip to Q6)
- ☐ No, and no plans to consider it (Skip to Q6)

6. 6.What was the reason why your team did not combine large language models with UAVs in the project?

请选择所有适用项。

- ☐ Existing technology has met the project requirements
- ☐ Existing large language models cannot meet performance requirements
- ☐ Excessive cost
- ☐ Security risks of large language models
- ☐ Lack of training data or fine-tuning methods
- ☐ Lack of relevant talents and technologies
- ☐ Unable to support required hardware
- ☐ Tight project cycle and difficult to integrate
- ☐ Restricted by regulations or policies
- ☐ Unaware of related applications
- ☐ Unclear business model
- ☐ 其他: 

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7. 7.Please rate the maturity of the following LLM applications in UAVs:(1 = Very immature, 3 = Neutral, 5 = Very mature)

请选择所有适用项。

	unclear	1 point	2 point	3 point	4 point	5 point
<b>Natural Language Command Parsing</b> (Convert user's natural language commands into executable instructions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Multimodal Information Parsing</b> (Extract information and generate language descriptions based on drone images, videos and remote sensing data)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Single-UAV Task Reasoning and Planning</b> (Decompose tasks and plan paths based on mission objectives, environmental constraints, and real-time status)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Multi-UAV Task Reasoning and Planning</b> (Implement task allocation, role division and dynamic replanning in a multi-objective and multi-resource environment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>RAG-based Decision Support</b> (Retrieve external knowledge such as laws, maps, and scenarios to enhance reasoning and decision-making)						

RAG-based Decision Control Logic and Support (Retrieve Command external knowledge Generation (Output such as laws, maps, executable underlying and scenarios to logic control code enhance reasoning according to mission and decision-making) planning and

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language instructions, Control Logic and such as PX4 and Command MAVLink Instructions) Generation (Output

executable underlying Control Logic and logic control code Command according to mission Optimization (Optimize planning and communication language instructions, strategies, link such as PX4 and configuration and anti-MAVLink instructions) interference design

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between drones) Control Logic and

Command Information Summary Optimization (Optimize and Report communication Generation (Generate strategies, link summaries and configuration and anti-reports based on interference design drone logs and sensor data) between drones)

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Information Summary LLM-based and Report Chatbot (Based on Generation (Generate continuous question-summaries and and-answer dialogue, reports based on task management, drone logs and sensor status query and user data) feedback are realized)

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LLM-based Chatbot (Based on continuous question-and-answer dialogue, task management, status query and user feedback are realized)

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8. 8.Are there other application scenarios for LLMs in UAVs?

9. What are the primary methods for integrating LLMs with UAVs in the current industry?

请选择所有适用项。

☐ Offboard Invocation: large models are deployed in the cloud or on ground equipment (providing decision support through external interfaces)

☐ Onboard Control: The large model is embedded in the control system of the drone (directly generating flight control instructions to achieve autonomous mission execution and action control)

☐ Onboard Assistance: The large model is deployed outside the drone's control system (to assist in mission planning, path reasoning, and decision support, but not to directly control flight)

☐ 其他: \_\_\_\_\_

10. 10.What is the perceived degree of necessity for the involvement of large models in the following categories of UAV-related work? (1 = Not necessary at all, 3 = Neutral, 5 = Very necessary)

请选择所有适用项。

	unclear	1 point	2 point	3 point	4 point	5 point
<b>Information Input</b> (Convert user instructions and perception data into executable tasks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Task Planning</b> ((Inferring tasks and planning execution paths))	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Control Execution</b> (Generate and optimize flight control instructions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Result Feedback</b> (Output task summary and interactive feedback information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. 11.Do you refer to academic research in your work? Please give a brief explanation

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12. 12.What differences do you think there are between academia and industry in the combination of UAVs and large language models ?

请选择所有适用项。

- ☐ Different development process (academic progress is faster than industrial progress)
- ☐ Different development process (industrial progress is faster than academic progress)
- ☐ Different focus
- ☐ Different technical requirements
- ☐ Different main integration methods of LLMs and UAVs
- ☐ Don't know
- ☐ 其他: \_\_\_\_\_

13. 13.What do you think are the reasons behind these differences between academia and industry?

请选择所有适用项。

- ☐ Difficulty in actual project development and integration
- ☐ Actual projects have high requirements for technology maturity and stability
- ☐ Academic research issues are out of touch with industrial needs
- ☐ High computing resource requirements
- ☐ Immaturity of lightweight large models
- ☐ Conflict between latency and real-time requirements
- ☐ Model robustness and reliability challenges
- ☐ Lack of large model training data
- ☐ Data privacy security and sharing restrictions
- ☐ High computing power/hardware costs
- ☐ Regulatory and policy uncertainty
- ☐ Commercial input-output ratio factors
- ☐ 其他: \_\_\_\_\_

14. 14.Thank you for completing our questionnaire. Do you have any other comments or suggestions for this questionnaire? If so, please write them below.

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15. 15.To thank you for your participation, we will randomly select two participants to receive a reward valued at 50 USDT's ETH each. If you would like to participate, please provide your Ethereum address.
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