

IVISTA

China Intelligent Vehicle Index

No. IVISTA-SM-III.VTS-RP-A0-2023

Intelligent Interaction Index Voice and Touch-Screen Rating Protocol

(Version 2023)

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Voice and Touch-Screen Rating Protocol

1 Scope

This document specifies the rating methods of IVISTA China Intelligent Vehicle Index - Intelligent Interaction Index - Voice and Touch-Screen.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute indispensable provisions of this protocol. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 36464.5-2018 Information Technology - Intelligent Speech Interaction System - Part 5: In-vehicle Terminal

3 Rating Methods

3.1 General

The voice and touch-screen rating includes speech interaction rating, touch screen interaction rating, terminal interconnection rating and head-up display rating. To be specifically, the speech interaction rating includes 6 items: wakeup, functional satisfaction, functional richness, dialect support, sound localization and noise shielding; the touch screen interaction rating includes 5 items: availability, richness, application start-up time, fluency and driving interaction safety; the terminal interconnection rating includes 1 item: mobile phone interconnection; the head-up display rating includes 1 item: functional richness. The scoring is shown in Table 1.

Table 1 Scoring of Speech, Touch Screen, Terminal Interconnection and Head-up Display

Rating Item		Test Scenario		Rating Index	Score	Total Score
Speech interaction	Wakeup	Speech wakeup	Wakeup ratio	Wakeup ratio, ρ	1.5	4
			Wakeup time	Wakeup time, T_w	1.5	
		Button-controlled wakeup		Whether the system is woken up successfully	1	
	Functional satisfaction	Navigation		Input instruction completion	4	10
		Telephone			3	
		Music			2	
		Radio			1	
	Functional richness	Vehicle, system, entertainment, etc.		Whether the system can be controlled by speech	4	4
	Dialect support	Cantonese, Sichuanese, etc.		Whether the system supports dialect recognition	1	1
	Sound localization	Window control		Input instruction completion	2	6
		A/C control			2	
		Seat control			2	
	Noise shielding	Wakeup ratio		Wakeup ratio, ρ	2	4
Wakeup time		Wakeup time, T_w	2			

Table 1 (Continued)

Rating Item		Test Scenario	Rating Index	Score	Total Score
Touch screen interaction	Availability	Pixel density	PPI value	2	4
		Brightness adjustment	Brightness adjusting method	1	
		Easy operation	Number of interface switching operations	1	
	Richness	Online music	Whether the vehicle has this function	0.5	1
		Application support	Number of applications supported	0.5	
	Application start-up time	Navigation	Start-up time, Ts	2	6
		Telephone		2	
		Music		1	
		Radio		0.5	
		Setting		0.5	
	Fluency	Contact list	Maximum successive frame stuttering count, P Average frames per second, X	2	4
		Call records list		2	
	Driving interaction safety	A/C setting	The max time of the sight off the road, T	3	5
			The number of the sight off the road, N	1	
The number of the steps, n			1		
Terminal interconnection	Mobile phone interconnection	Remote window closing	Whether the vehicle has this function	1	6
		Remote A/C start	Whether the vehicle has this function	1	
		Display of vehicle localization	Whether the vehicle has this function	1	
		Remote honking and flashing	Whether the vehicle has this function	1	
		Remote unlocking/locking	Whether the vehicle has this function	1	
		Hotspot interconnection	Whether the vehicle has this function	1	
Head-up display	Functional richness	Vehicle speed display	Whether the vehicle has this function	0.5	5
		Navigation indication	1.5 points for single-arrow navigation indication 2.5 points for lane-level navigation indication 3.5 points for AR navigation indication	3.5	
		Speed limit prompt	Whether the vehicle has this function	0.5	
		Display of assisted driving state	Whether the vehicle has this function	0.5	

3.2 Speech interaction rating

3.2.1 Wakeup rating

Wakeup rating includes 2 items, i.e., wakeup ratio and wakeup time, and the scoring

rules are shown in Table 2.

Table 2 Scoring Rules for Wakeup

Rating Item		Test Scenario	Scoring Rules	Score
Speech wakeup	Wakeup ratio	Idle wakeup	1.5 points if $\rho \geq 95\%$; 1 point if $92\% \leq \rho < 95\%$; No point if $\rho < 92\%$	1.5

Table 2 (Continued)

Rating Item		Test Scenario	Scoring Rules	Score
Speech wakeup	Wakeup time	Wakeup response time	1.5 points if $T_w \leq 1.5$ s; 1 point if 1.5 s $< T_w \leq 2$ s; No point if $T_w > 2$ s	1.5
Button-controlled wakeup		Steering wheel button	1 point for successful wakeup; No point for wakeup failure	1

3.2.2 Functional satisfaction rating

Functional satisfaction rating includes 4 items, i.e., navigation, telephone, music and radio, and the specific scoring rules are shown in Table 3.

Table 3 Scoring Rules for Functional Satisfaction

Rating Item		Test Scenario	Scoring Rules	Score
Functional satisfaction	Navigation	Turn-on mode	0.2 points if the system correctly understands and executes an instruction	2
		Recommendation of point of interest	0.2 points if the system correctly understands and executes an instruction	2
	Telephone	Turn-on mode	0.3 points if the system correctly understands and executes an instruction	3
	Music	Turn-on mode	0.1 points if the system correctly understands and executes an instruction	1
		Switching function	0.1 points if the system correctly understands and executes an instruction	1
	Radio	Turn-on mode	0.1 points if the system correctly understands and executes an instruction	1

3.2.3 Functional richness rating

Functional richness rating includes 4 items, i.e., vehicle control, system settings, infotainment and others, and the specific scoring rules are shown in Table 4.

Table 4 Scoring Rules for Functional Richness

Rating Item	Test Scenario	Scoring Rules	Score
Functional richness	Vehicle control	0.1 points for each additional function	1
	System settings	0.1 points for each additional function	1
	Infotainment	0.1 points for each additional function	1
	Others	0.1 points for each additional function	1

3.2.4 Dialect support rating

Dialect support rating is scored according to the types of dialects supported by the system, and the scoring rules are shown in Table 5.

Table 5 Scoring Rules for Dialect Support

Rating Item	Test Scenario	Scoring Rules	Score
Dialect support	Cantonese, Sichuanese, etc.	0.2 points for each dialect supported	1

3.2.5 Sound localization rating

Sound localization rating is carried out on the driver's seat, the front passenger's seat and the left and right outboard seats in the second row. The control support of windows, air conditioners and seats is scored according to speech instructions. The scoring rules are shown in Table 6.

Table 6 Scoring Rules for Sound Localization

Rating Item	Test Scenario	Scoring Rules	Score
Sound localization	Window	Window control 10 instructions per position, 4 positions in total 0.05 points if the system correctly understands and executes an instruction	2
	A/C	A/C control 10 instructions per position, 4 positions in total 0.1 points if the system correctly understands and executes an instruction	2
	Seat	Seat control 10 instructions per position, 4 positions in total 0.1 points if the system correctly understands and executes an instruction	2

3.2.6 Noise shielding rating

Noise shielding rating is scored according to the wakeup ratio and wakeup time of speech interaction system under typical high-speed noise, and the scoring rules are shown in Table 7.

Table 7 Scoring Rules for Noise Shielding

Rating Item	Test Scenario	Scoring Rules	Score
Noise shielding	Wakeup ratio	2 points if $\rho \geq 90\%$; 1 point if $85\% \leq \rho < 90\%$; No point if $\rho < 85\%$	2
	Wakeup time	2 points if $T_w \leq 1.7$ s; 1 point if 1.7 s $< T_w \leq 2.2$ s; No point if $T_w > 2.2$ s	2

3.3 Touch screen interaction rating

3.3.1 Availability rating

Availability rating includes 3 items, i.e., pixel density, brightness adjustment and easy operation, and the specific scoring rules are shown in Table 8.

Table 8 Scoring Rules for Availability

Rating Item	Test Scenario	Scoring Rules	Score
Availability	Pixel density	2 points if $PPI \geq 190$; 1 point if $150 \leq PPI < 190$; 0 points if $PPI < 150$	2
	Brightness adjustment	0.5 points for manual adjustment only; 1 point for both manual adjustment and adaptive adjustment	1
	Easy operation	No point for more than 2 operations; 0.5 points for 2 operations; 1 point for 1 operation	1

3.3.2 Richness rating

Richness rating includes online music, application download function or whether applications such as navigation, online music, online radio, online video, weather and smart home are available. The specific scoring rules are shown in Table 9.

Table 9 Scoring Rules for Richness

Rating Item	Test Scenario	Scoring Rules	Score
Richness	Online music	0.5 points if this function is provided; otherwise, no point	0.5
	Application support	No point if the number of applications supported < 5 ; 0.5 points if the number of applications supported ≥ 5	0.5

3.3.3 Application start-up time rating

Application start-up time rating includes 5 items, i.e., navigation, music, radio, telephone and settings, and the specific scoring rules are shown in Table 10.

Table 10 Scoring Rules for Application Start-up Time

Rating Item	Test Scenario	Scoring Rules	Score
Application start-up time	Navigation	No point if $T_s \geq 2$ s;	2
	Music	Half score if $1.5 \text{ s} < T_s \leq 2$ s;	2
	Radio	Full score if $T_s \leq 1.5$ s	1
	Telephone	No point if $T_s \geq 1.5$ s;	0.5
	Setting	Half score if $0.8 \text{ s} < T_s \leq 1.5$ s; Full score if $T_s \leq 0.8$ s	0.5

3.3.4 Fluency rating

Fluency rating includes 2 items, i.e., contact list and call records list, and the specific scoring rules are shown in Table 11.

Table 11 Scoring Rules for Fluency

Rating Item	Test Scenario	Scoring Rules	Score
Screen fluency	Contact list	No point if $P \geq 4$; If $P < 4$:	2
	Call records list	No point if $X < 85\% \cdot N$; 1 point if $85\% \cdot N \leq X < 95\% \cdot N$; 2 points if $X \geq 95\% \cdot N$	2

3.3.5 Driving interaction safety rating

Driving interaction safety rating includes 1 item, i.e., A/C setting, and the specific scoring rules are shown in Table 12.

Table 12 Scoring Rules for Driving Interaction Safety

Rating Item		Test Scenario	Scoring Rules	Score
Driving interaction safety	The max time of the sight off the road, T	A/C setting	No point if $T_s \geq 3$ s; 1.5 points if $2 \text{ s} < T_s < 3$ s; 3 points if $T_s \leq 2$ s	3
	The number of the sight off the road, N		No point if $N > 8$; 0.5 points if $5 < N \leq 8$; 1 point if $N \leq 5$	1
	The number of the steps, n		No point if $N > 9$; 0.5 points if $6 < n \leq 9$; 1 point if $n \leq 6$	1

3.4 Terminal interconnection rating

Terminal interconnection rating includes 1 item, i.e., mobile phone interconnection, and the specific scoring rules are shown in Table 13.

Table 13 Scoring Rules for Terminal Interconnection

Rating Item	Test Scenario	Scoring Rules	Score
Mobile phone interconnection	Remote window closing	1 point if this function is provided; otherwise, no point	1
	Remote A/C start	1 point if this function is provided; otherwise, no point	1
	Display of vehicle localization	1 point if this function is provided; otherwise, no point	1
	Remote honking and flashing	1 point if this function is provided; otherwise, no point	1
	Remote unlocking/locking	1 point if this function is provided; otherwise, no point	1
	Hotspot interconnection	1 point if this function is provided; otherwise, no point	1

3.5 Head-up display rating

Head-up display rating includes 1 item, i.e., functional richness, and the specific scoring rules are shown in Table 14.

Table 14 Scoring Rules for Head-up Display

Rating Item	Test Scenario	Scoring Rules	Score
Functional richness	Vehicle speed display	0.5 points if this function is provided; otherwise, no point	0.5
	Single-arrow navigation indication	Corresponding points for each function provided; no point if no navigation indication is provided	1.5
	Lane-level navigation indication		2.5
	AR navigation indication		3.5
	Speed limit prompt	0.5 points if this function is provided; otherwise, no point	0.5
	Display of assisted driving state	0.5 points if this function is provided; otherwise, no point	0.5