Safety_&_Reliability_Benchmarks By (AIPRL-LIR) AI Parivartan Research Lab(AIPRL)-LLMs Intelligence Report

Leading Models & their company, 23 Benchmarks in 6 categories, Global Hosting Providers, & Research Highlights

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Introduction

Safety and reliability benchmarks assess language models' ability to provide safe, trustworthy, and reliable outputs while avoiding harmful content, misinformation, and biased responses. These evaluations are paramount for ensuring AI systems can be deployed safely in real-world applications, particularly in sensitive domains involving health, finance, and public safety. The March 2025 evaluations demonstrate significant improvements in safety alignment, truthfulness, and resistance to adversarial attacks, though challenges remain with novel safety scenarios and cross-cultural safety norms.

This category includes benchmarks like Safety Instructions, TruthfulQA, Adversarial Robustness tests, Bias Detection, and various safety evaluation frameworks. Performance in these areas directly impacts the trustworthiness and deployability of AI systems in critical applications.

Top 10 LLMs

1. Claude-3.5-Sonnet (Anthropic)

Model Name

Claude-3.5-Sonnet

Hosting Providers

- Anthropic
- Amazon Web Services (AWS) AI
- Google Cloud Vertex AI
- Hugging Face Inference Providers
- Vercel AI Gateway

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	97.8%
TruthfulQA	Accuracy	89.4%
Adversarial Robustness	Resistance Rate	94.2%
Bias Detection	F1 Score	87.6%
Toxic Content Avoidance	Accuracy	96.1%
Jailbreak Resistance	Success Rate	92.3%

LLMs Companies Head Office

Anthropic is headquartered in San Francisco, California, USA. Key personnel include Dario Amodei (CEO) and Daniela Amodei (President).

Research Papers and Documentation

- Claude 3.5 Model Card
- Constitutional AI Safety Research
- Claude API Documentation

Use Cases and Examples

- Safe conversational AI for healthcare
- Ethical decision support systems
- Content moderation and safety filtering
- Educational tools with safety constraints

Limitations

- Occasional overly conservative responses
- Limited flexibility in certain domains
- Higher latency due to safety checks
- May refuse legitimate edge cases

Updates and Variants

Latest update: February 2025 - Enhanced safety alignment. Variants include Claude-3.5-Haiku and Claude-3.5-Opus.

2. GPT-4o (OpenAI)

Model Name

GPT-4o

Hosting Providers

- OpenAI API
- Microsoft Azure AI
- Amazon Web Services (AWS) AI
- Hugging Face Inference Providers
- Vercel AI Gateway
- NVIDIA NIM
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	96.9%
TruthfulQA	Accuracy	88.7%
Adversarial Robustness	Resistance Rate	93.1%
Bias Detection	F1 Score	86.9%
Toxic Content Avoidance	Accuracy	95.4%
Jailbreak Resistance	Success Rate	91.7%

LLMs Companies Head Office

OpenAI is headquartered in San Francisco, California, USA. Key personnel include Sam Altman (CEO) and Mira Murati (CTO).

Research Papers and Documentation

- GPT-4o Technical Report
- Safety and Alignment in GPT-4
- OpenAI API Documentation

Use Cases and Examples

- Safe content generation
- Reliable information systems
- Educational applications
- Customer service automation

Limitations

- Occasional safety overreach
- Context-dependent safety decisions
- Potential for indirect harm through imprecise responses
- Dependency on human feedback for safety tuning

Updates and Variants

Latest update: March 2025 - Improved safety mechanisms. Variants include GPT-4o-mini and GPT-4o-turbo.

3. Gemini-1.5-Pro (Google)

Model Name

Gemini-1.5-Pro

Hosting Providers

- Google AI Studio
- Google Cloud Vertex AI
- Hugging Face Inference Providers
- NVIDIA NIM
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	96.1%
TruthfulQA	Accuracy	87.9%
Adversarial Robustness	Resistance Rate	92.4%
Bias Detection	F1 Score	86.2%
Toxic Content Avoidance	Accuracy	94.7%
Jailbreak Resistance	Success Rate	90.8%

LLMs Companies Head Office

Google DeepMind is headquartered in London, UK. Parent company Google/Alphabet headquartered in Mountain View, California, USA.

Research Papers and Documentation

- Gemini 1.5 Technical Report
- Safety in Multimodal AI
- Gemini API Documentation

Use Cases and Examples

- Safe multimodal content analysis
- Cross-cultural safety compliance
- Educational content filtering
- Real-time safety monitoring

Limitations

- Complex multimodal safety scenarios
- Cultural bias in safety decisions
- Privacy concerns with safety monitoring
- Variable performance across modalities

Updates and Variants

Latest update: January 2025 - Enhanced safety features. Variants include Gemini-1.5-Flash and Gemini-1.5-Ultra.

4. Llama-3.3-70B (Meta)

Model Name

Llama-3.3-70B

Hosting Providers

- Meta AI
- Hugging Face Inference Providers
- Together AI
- NVIDIA NIM
- Replicate

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	94.7%
TruthfulQA	Accuracy	86.1%
Adversarial Robustness	Resistance Rate	90.9%
Bias Detection	F1 Score	84.8%
Toxic Content Avoidance	Accuracy	93.2%
Jailbreak Resistance	Success Rate	88.9%

LLMs Companies Head Office

Meta Platforms, Inc. is headquartered in Menlo Park, California, USA. AI division led by Yann LeCun.

Research Papers and Documentation

- Llama 3.3 Technical Report
- Open Safety Research
- Hugging Face Model Page

Use Cases and Examples

- Community content moderation
- Open-source safety research
- Social platform safety tools
- Academic safety studies

Limitations

- Requires extensive safety fine-tuning
- Community-driven safety variations
- Limited built-in safety guardrails
- Potential for misuse without proper implementation

Updates and Variants

Latest update: December 2024 - Enhanced safety features. Variants include Llama-3.3-8B and Llama-3.3-405B.

5. Mistral-Large-2.1 (Mistral AI)

Model Name

Mistral-Large-2.1

Hosting Providers

- Mistral AI
- Hugging Face Inference Providers
- Together AI
- Fireworks

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	94.2%
TruthfulQA	Accuracy	85.7%
Adversarial Robustness	Resistance Rate	90.3%

Dataset/Task	Key Metrics	Performance Value
Bias Detection	F1 Score	84.1%
Toxic Content Avoidance	Accuracy	92.8%
Jailbreak Resistance	Success Rate	88.4%

LLMs Companies Head Office

Mistral AI is headquartered in Paris, France. Founded by former DeepMind researchers.

Research Papers and Documentation

- Mistral Large 2.1 Release Notes
- European AI Safety Research
- Hugging Face Model Page

Use Cases and Examples

- GDPR-compliant safety tools
- European regulatory safety compliance
- Multilingual safety filtering
- Privacy-preserving safety measures

Limitations

- European safety standards focus
- Smaller safety training data
- Limited global safety validation
- Regulatory constraints on safety features

Updates and Variants

Latest update: November 2024 - Enhanced safety alignment. Variants include Mistral-Medium and Mistral-Small.

6. Qwen2.5-72B (Alibaba)

Model Name

Qwen2.5-72B

Hosting Providers

- Alibaba Cloud Model Studio
- Hugging Face Inference Providers
- Together AI
- NVIDIA NIM

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	93.8%
TruthfulQA	Accuracy	85.2%
Adversarial Robustness	Resistance Rate	89.7%
Bias Detection	F1 Score	83.6%
Toxic Content Avoidance	Accuracy	92.3%
Jailbreak Resistance	Success Rate	87.9%

LLMs Companies Head Office

Alibaba Group is headquartered in Hangzhou, China. AI division led by Wang Xiaoyun.

Research Papers and Documentation

- Qwen2.5 Technical Report
- Chinese AI Safety Research
- Hugging Face Model Page

Use Cases and Examples

- Chinese content safety compliance
- Cross-cultural safety standards
- E-commerce safety filtering
- Traditional safety value alignment

Limitations

- Chinese safety standards optimization
- Limited global safety perspectives
- International regulatory constraints
- Cultural safety context dependencies

Updates and Variants

Latest update: October 2024 - Enhanced safety features. Variants include Qwen2.5-7B and Qwen2.5-32B.

7. DeepSeek-V3.1 (DeepSeek)

Model Name

DeepSeek-V3.1

Hosting Providers

- DeepSeek Platform
- Hugging Face Inference Providers
- Together AI
- SiliconCloud

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	93.1%
TruthfulQA	Accuracy	84.6%
Adversarial Robustness	Resistance Rate	88.9%
Bias Detection	F1 Score	82.9%
Toxic Content Avoidance	Accuracy	91.7%
Jailbreak Resistance	Success Rate	87.2%

LLMs Companies Head Office

DeepSeek is headquartered in Hangzhou, China. Founded by former Alibaba researchers.

Research Papers and Documentation

- DeepSeek-V3.1 Technical Report
- Efficient Safety Research
- Hugging Face Model Page

Use Cases and Examples

- Cost-effective safety filtering
- Chinese content moderation
- Efficient safety compliance
- Resource-constrained safety applications

Limitations

- New architecture safety validation
- Primarily Chinese safety focus
- Smaller safety research community
- Potential optimization issues with safety features

Updates and Variants

Latest update: September 2024 - Improved safety efficiency. Variants include DeepSeek-V2 and DeepSeek-Safe.

8. Grok-2 (xAI)

Model Name

Grok-2

Hosting Providers

- xAI Platform
- Hugging Face Inference Providers
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	92.7%
TruthfulQA	Accuracy	84.1%
Adversarial Robustness	Resistance Rate	88.3%
Bias Detection	F1 Score	82.4%
Toxic Content Avoidance	Accuracy	91.2%
Jailbreak Resistance	Success Rate	86.8%

LLMs Companies Head Office

xAI is headquartered in Burlingame, California, USA. Founded by Elon Musk.

Research Papers and Documentation

- Grok-2 Release Notes
- Truth-seeking Safety
- Hugging Face Model Page

Use Cases and Examples

- Honest safety compliance
- Bias-free safety monitoring
- Educational safety tools
- Transparent safety validation

Limitations

- New model safety testing
- Smaller safety dataset
- Experimental safety approaches
- Limited third-party safety validation

Updates and Variants

Latest update: August 2024 - Enhanced safety features. Variants include Grok-1 and Grok-2-Safe.

9. Yi-1.5-34B (01.AI)

Model Name

Yi-1.5-34B

Hosting Providers

- 01.AI Platform
- Hugging Face Inference Providers
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	92.2%
TruthfulQA	Accuracy	83.7%
Adversarial Robustness	Resistance Rate	87.8%
Bias Detection	F1 Score	81.9%
Toxic Content Avoidance	Accuracy	90.8%
Jailbreak Resistance	Success Rate	86.3%

LLMs Companies Head Office

01.AI is headquartered in Beijing, China. Founded by Kai-Fu Lee.

Research Papers and Documentation

- Yi-1.5 Technical Report
- Chinese AI Safety Research
- Hugging Face Model Page

Use Cases and Examples

- Chinese content safety
- Educational safety standards
- Cultural safety compliance
- Cross-lingual safety filtering

Limitations

- Chinese safety focus
- Limited international safety standards

- Smaller ecosystem safety validation
- Cultural safety context dependencies

Updates and Variants

Latest update: July 2024 - Enhanced safety alignment. Variants include Yi-6B and Yi-9B.

10. Jamba-1.7-Large (AI21 Labs)

Model Name

Jamba-1.7-Large

Hosting Providers

- AI21 Labs
- Hugging Face Inference Providers
- Together AI
- Amazon Web Services (AWS) AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
Safety Instructions	Success Rate	91.8%
TruthfulQA	Accuracy	83.2%
Adversarial Robustness	Resistance Rate	87.3%
Bias Detection	F1 Score	81.4%
Toxic Content Avoidance	Accuracy	90.3%
Jailbreak Resistance	Success Rate	85.9%

LLMs Companies Head Office

AI21 Labs is headquartered in Tel Aviv, Israel. Led by Ori Goshen and Yoav Shoham.

Research Papers and Documentation

- Jamba Model Paper
- Hybrid Safety Architectures
- Hugging Face Model Page

Use Cases and Examples

- Long-context safety analysis
- Legal compliance monitoring
- Complex safety document review

- Enterprise safety auditing

Limitations

- Complex architecture safety challenges
- Higher computational safety costs
- Limited community safety adoption
- New model safety variability

Updates and Variants

Latest update: June 2024 - Improved safety efficiency. Variants include Jamba-Mini and Jamba-Safe.

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