

中国科技战略 China Technology Strategy

谷歌 I/O 大会发布全新一代大模型，能力大幅提升

Google Released the New-gen LLM in I/O 2023, with Great Capability Improvement

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热点速评 Flash Analysis

(Please see APPENDIX 1 for English summary)

事件

5月11日，谷歌2023年I/O开发者大会在硅谷召开，生成式AI是本场大会的重点，多位谷歌高管轮番上场，公布了一系列涉及全新大模型、AI聊天机器人、搜索、办公软件、云服务、安卓系统等与生成式AI相关的进展。

点评

全新一代大语言模型 PaLM 2 推出，多语言、推理和编程方面进展显著。谷歌的新一代大语言模型 PaLM 2 采用谷歌最新的 TPU 基础设施进行训练，擅长数学、推理、多语言翻译、编程。在多语言方面，PaLM 2 对 100 多种语言文本进行了训练，PaLM 2 已完成日语和韩语的训练，Bard 将会开放日语和韩语模式，其他语言会在接下来的版本中陆续开放。在推理方面，PaLM 2 扩大了数据集的范围，纳入了包含数学表达式的科学论文和网页，因此它在逻辑、常识推理和数学方面比上一代更强。在编程方面，PaLM 2 接受了超过 20 种编程语言的预训练，可以理解、生成和调试 Python、JavaScript、Prolog、Fortran 和 Verilog 等语言的代码，还能解释、修复错误背后的原因，以便开发者在世界各地进行协作。此外，为了适应不同的场合，谷歌构建了 Gecko（壁虎）、Otter（水獭）、Bison（野牛）、Unicorn（独角兽）从小到大的 4 种训练参数的 PaLM 2 模型。

对比 LLaMA 和 GPT，PaLM 2 竞争力十足。Bard 已取消等候名单，向 180 多个国家和地区开放。在具体的功能上，Bard 的聊天问答新增了图像互动，还升级了编程和导出功能，支持一键导出到 Gmail、谷歌文档、表格之中。据 Google 公布的技术报告，PaLM 2 在评估模型的常识推理和自然语言推理能力的 WinoGrande 数据集测试上获得了 90.9 的精度，高于 SOTA (LLaMA) 和 GPT-4，说明其拥有更强的上下文理解能力用以判断事件的真实性，而在 ARC-C 和 DROP 两个数据集上 PaLM 2 精度低于 SOTA 和 GPT-4，说明其在大规模阅读理解以及推理计算能力上相对较弱。StrategyQA、BB Hard 和 XCOPIA 三个数据集的高精度代表 PaLM 2 具有很强的规则理解、策略推理以及多语言文本理解能力。根据 PaLM 2 在 MATH、GSM8K、MGSM 三个数据集的测试结果可以得出，其在数学问题求解方面相对较弱，在语音情感识别以及多语言情感识别能力上相对于 SOTA 和 GPT-4 更强。

谷歌 All in AI，推出生成式 AI 全家桶。在本次大会上，谷歌宣布了超过 25 款由 PaLM 2 驱动的新产品和新功能。谷歌对标微软的 Copilot 推出了 Duet AI，Duet AI 将被全面集成至谷歌旗下的 Work Space，包括谷歌文档、表格、幻灯片、会议、GmailMeet 的自动会议摘要等等，同时还推出名为 Sidekick 的新功能，能跨不同的谷歌应用程序进行阅读、总结和回答文档中的问题。面对 Bing 的步步紧逼，谷歌搜索还将上线生成式 AI，在用户搜索问题后会先出现 AI 提供的更直接的答案。此外，谷歌还推出了基于谷歌旗舰芯片 Google Tensor G2 的 Pixel 7a、Pixel Fold 和 Pixel Tablet 平板电脑，Pixel Tablet 平板电脑售价 499 美元，定位于 Google Home 智能家居的中控设备。我们认为 Google 和 OpenAI 不断加剧的激烈竞争，会推进生成式 AI 的发展，ALL in AI 的 Google 或将成为 OpenAI 最有力的竞争对手。

风险

大模型发展不及预期，AI 推广不及预期，政策因素等。

图表 1 PaLM 2 与其他大模型数据集测试精度对比

Task	SOTA	GPT-4	PaLM	PaLM 2
WinoGrande	87.5	87.5	85.1	90.9
ARC-C	96.3	96.3	88.7	95.1
DROP	88.4	80.9	70.8	85
StrategyQA	81.6		81.6	90.4
CSQA	91.2		80.7	90.4
XCOPA	89.9		89.9	94.4
BB Hard	65.2		65.2	78.1

资料来源: PaLM 2 技术报告, 海通国际

图表 2 PaLM 2 与其他大模型数据集测试精度对比

Task	SOTA	PaLM	Minerva	GPT-4	PaLM 2	Flan-PaLM 2
MATH	50.3	8.8	33.6/50.3	42.5	34.3/48.8	33.2/45.2
GSM8K	92.0	56.5/74.4	58.8/78.5	92.0	80.7/91.0	84.7/92.2
MGSM	72	45.9/57.9	-	-	72.2/87.0	75.9/85.8

资料来源: PaLM 2 技术报告, 海通国际

APPENDIX 1

Summary

Event

On May 11th, the annual Google I/O developer conference was held in Silicon Valley. Generative AI was the focus of this event, with multiple Google executives taking the stage to announce a series of advancements related to generative AI, including new large-scale models, AI chatbots, search, office software, cloud services, and Android system.

Comment

Google introduced the next generation of its large language model, PaLM 2, which shows significant progress in multilingualism, reasoning, and programming. PaLM 2, trained on Google's latest TPU infrastructure, excels in mathematics, reasoning, multilingual translation, and programming. In terms of multilingualism, PaLM 2 has been trained on texts from over 100 languages, with completed training for Japanese and Korean. Bard will develop Japanese and Korean modes, while other languages will be introduced in future versions. In the field of reasoning, PaLM 2 has expanded its dataset to include scientific papers and webpages containing mathematical expressions, making it stronger in logic, common-sense reasoning, and mathematics compared to its predecessor. In programming, PaLM 2 has been pre-trained on over 20 programming languages, enabling it to understand, generate, and debug code in languages such as Python, JavaScript, Prolog, Fortran, and Verilog. It can also provide explanations and suggest fixes for errors, facilitating collaboration among developers worldwide. Additionally, Google has built four PaLM 2 models with different training parameters, namely Gecko, Otter, Bison, and Unicorn, to cater to different use cases and requirements.

Compared to LLaMA and GPT, PaLM 2 is highly competitive. Bard has canceled the waiting list and opened access to over 180 countries and regions. In terms of specific functionalities, Bard's chat-based question-answering system has added interactive image support and has upgraded programming and export features, allowing easy exporting to Gmail, Google Docs, and Sheets. According to a technical report released by Google, PaLM 2 achieved an accuracy of 90.9 on the WinoGrande dataset, which evaluates models' common-sense reasoning and natural language inference abilities. This accuracy surpasses the SOTA (LLaMA) and GPT-4, indicating its stronger contextual understanding for determining the truthfulness of events. However, PaLM 2 performed lower than the SOTA and GPT-4 on the ARC-C and DROP datasets, highlighting its relative weakness in large-scale reading comprehension and reasoning abilities. PaLM 2 demonstrated high accuracy on the StrategyQA, BB Hard, and XCOPA datasets, showcasing its strong capabilities in rule understanding, strategic reasoning, and multilingual text comprehension. Based on the results from the MATH, GSM8K, and MGSM datasets, PaLM 2 showed relative weaknesses in mathematical problem-solving but exhibited stronger performance in speech emotion recognition and multilingual emotion recognition compared to the SOTA and GPT-4.

Google is going all-in on AI with the launch of its generative AI suite. During this conference, Google announced over 25 new products and features powered by PaLM 2. Taking aim at Microsoft's Copilot, Google introduced Duet AI, which will be fully integrated into Google's Work Space, including Google Docs, Sheets, Slides, Meet, and Gmail. Duet AI offers automatic meeting summaries and a new feature called Sidekick, which enables reading, summarizing, and answering questions across different Google applications. In response to Bing's growing competition, Google Search will also incorporate generative AI, providing more direct answers to user search queries. Additionally, Google unveiled the Pixel 7a, Pixel Fold, and Pixel Tablet, all powered by the flagship Google Tensor G2 chip. The Pixel Tablet, priced at \$499, is positioned as a central control device for Google Home smart devices. The intensified competition between Google and OpenAI is expected to drive the advancement of generative AI, and Google's strong commitment to AI makes it a formidable competitor to OpenAI.

Risks

The development of large models may not meet expectations, AI adoption may not meet expectations, and there may be policy factors involved.

附录 APPENDIX

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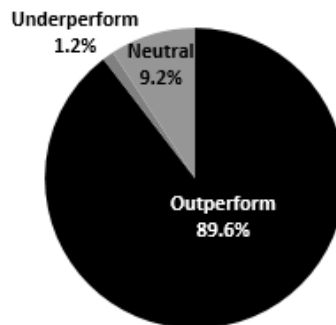
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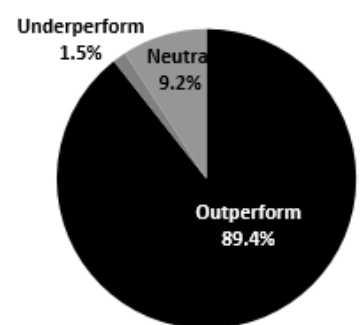
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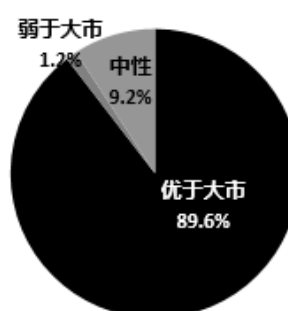
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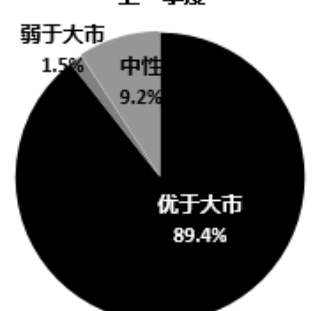
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