

I P R

**THE FOUNDATION OF INNOVATION
RESPECTING AND PROTECTING INTELLECTUAL PROPERTY**

创新的必由之路 尊重和保护知识产权

IPR

INTELLECTUAL
PROPERTY
RIGHTS



BRIDGING HORIZONS OF INNOVATIONS

Sharing IP, Driving Innovation

BRIDGING HORIZONS OF INNOVATIONS

Sharing Intellectual Property, Driving Innovation

跨 越 创 新 边 界

分享知识产权，推动创新

The innovation landscape is changing. Digital technology is advancing faster than ever before. Collaboration will become the key success factor for the industries of tomorrow for the good of all.

At the event, we will discuss these opportunities and challenges with a panel of partners, peers and industry experts.

We will also announce some of our latest innovations, with our partners, in areas like HDR Vivid and Audio Vivid, 5G and its industry applications, as well as automotive solutions and terminal devices.

本届论坛以“跨越创新边界”为主题，邀请行业资深专家进行研讨，阐述华为公司创新技术的应用场景。

随着全球创新格局的演变和数字技术的高速迭代，产业的成功和可持续发展要求更大范围的国际协同，以及开放共享的技术创新。论坛将深入讨论企业创新和知识产权保护领域的机遇与挑战。

Time: 16:00 (GMT+8), July 13th, 2023 / 时间：2023 年 7 月 13 日 16:00

Venue: Bantian Base, Huawei, Shenzhen, China / 地点：深圳华为坂田基地 G 区 华为旗舰店

AGENDA :

Opening Remarks by
Song Liuping
Chief Legal Officer, Huawei

16:00-16:05

16:05-16:10

Video Message from
Tomas Lamanauskas
Deputy Secretary-General,
International Telecommunication Union

16:10-16:15

Keynote Address by
Randall Ray Rader
Former Chief Judge,
United States Court of Appeals for
the Federal Circuit

16:15-16:20

Keynote Address by
Junfeng Wang
Global Chairman,
King & Wood Mallesons

16:20-17:10

*Sharing Session
by Innovators*

17:10-17:20

Keynote Presentation by
Alan Fan
Head of Intellectual Property Rights
Department, Huawei

17:20-18:00

Panel Discussion
WORKING TOGETHER: RULES AND REALITIES FOR INNOVATORS AND IMPLEMENTORS

Moderator : **Dr. Yahong Li** Associate Professor and Director, LLM Program in Technology and IP Law, University of Hong Kong

Panelists :

Alan Fan	Head of Intellectual Property Rights Department, Huawei
Mattia Fogliacco	President, Sisvel
Dr. Kung-Chung Liu	Professor of Law, Singapore Management University
Dr. Zhang Ping	Chair Professorship Professor of Law, Peking University
Zhongqi Zhou	Former President, Licensing Executives Society China

18:00-18:30

Media Q&A

18:30 on

*Cocktail at Nice
Coffee & Bakery*

议程：

开幕致辞

宋柳平

华为首席法务官

主题发言

兰道·雷德

美国联邦巡回上诉法院前任大法官

创新代表分享

专题研讨：携手共创—平衡视角下的全球知产生态系统

评议人：李亚虹 香港大学知识产权和信息技术项目主任

研讨嘉宾：樊志勇 华为副总裁、知识产权部部长

刘孔中 新加坡管理大学法学教授

马蒂亚·弗格里亚科 西斯威尔公司总裁

张平 北京大学法学院教授

周中琦 中国许可贸易工作者协会前会长

自助晚宴

视频致辞

托马斯·拉玛瑙斯卡斯

国际电信联盟（ITU）副秘书长

主题发言

王俊峰

金杜律师事务所全球管理委员会主席

主题演讲

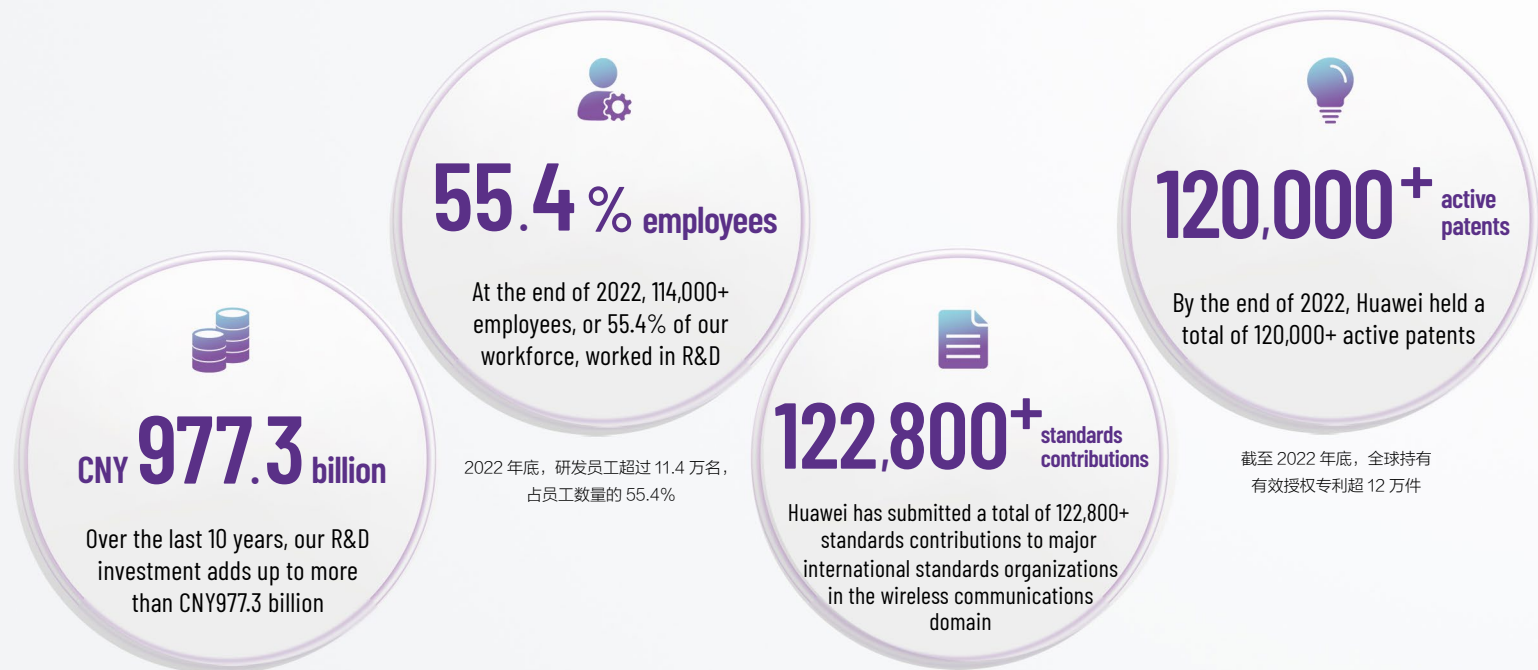
樊志勇

华为副总裁、知识产权部部长

媒体 Q&A

FORUM ON INNOVATION AND INTELLECTUAL PROPERTY RIGHTS

华为 创新和知识产权论坛系列



近十年累计投入的研发费用超过 9773 亿人民币

在无线通信领域已向主要国际标准组织累计提交 122,800+ 篇标准提案

For the past 30 years, Huawei has provided innovative products and solutions and has become a world leader in many aspects of technology and in many of its solutions. This is the result of Huawei's sustained strategic investment for strategic breakthroughs.

Long-term investment in innovation, backed by the utmost respect for intellectual property, has been the driving force behind Huawei's business success, and also forms the cornerstone of our vision to build a fully connected and intelligent world.

Respecting and protecting intellectual property (IP) is the foundation of innovation. While promoting our own growth, we also license to other industry players to promote shared success. Over the past

作为全球领先的 ICT 解决方案提供商，经过三十多年的发展，华为在产业领域的多个方向做到了技术和解决方案世界领先，这是华为多年来坚持战略投入、厚积薄发的必然结果。

持续创新与尊重知识产权是华为取得今日商业成就的源动力，也是未来我们致力构建万物互联的智能世界的基石。

华为坚信尊重和保护知识产权是创新的必由之路。在自身成长的同时，华为通过专利许可活动，共享技术，分享利益，促进全产业链的繁荣发

20 years, Huawei has conducted extensive cross-licensing negotiations with key patent holders in the ICT industry and has entered into nearly 200 patent license agreements with major global ICT companies across Europe, the United States, Japan, and South Korea.

Since 2019, Huawei has hosted three forums on innovation and intellectual property, to which we have invited panels of partners, peers and industry experts in the fields of intellectual property and innovation to discuss how IP can be used as an engine of scientific and technological innovation in the ever-changing landscape, as well as how to promote wider international collaboration and deeper integration of industry, academia, research institutes, and users. We constantly bring up new topics for open, shared technological innovation.

展和合作共赢。在过去 20 年里，华为跟 ICT 行业的主要专利持有人进行了广泛的交叉许可谈判，目前已经与美国、欧洲、日韩等主要 ICT 厂家签署了近 200 份专利许可协议。

自 2019 年开始，我们已举办了三届创新和知识产权论坛，邀请全球知识产权及创新领域资深专家研讨如何将知识产权保护作为科技创新的前进引擎；随着全球科技创新格局演变和数字技术迭代，如何促进在更大范围内的国际协同和产学研用深度融合，并对基于开放共享的技术创新提出了全新的课题。

01

2019: PRESS CONFERENCE ON PROTECTING IP, DRIVING INNOVATION

2019年：华为首届创新和知识产权发布会



PROTECTING IP, DRIVING INNOVATION

On June 27, 2019, Huawei held a press conference at the company's headquarters, and released a white paper on innovation and intellectual property (IP), warning against the issue being politicized. Song Liuping, Huawei's Chief Legal Officer, said during the conference that IP is the cornerstone of innovation and its politicization threaten progress across the world.

As a technology company, respecting and protecting intellectual property has always been a core principle of Huawei's business. Over the past 30 years, Huawei has paid more than 6 billion US dollars in royalties to legally implement the IP of other companies. Nearly 80% was paid to American companies. Huawei shares its IP with industry peers through licensing and cross-licensing agreements. Huawei wants its technology to create practical value in the marketplace. Since 2015, Huawei has received over 1.4 billion U.S. dollars in licensing revenue.

2019年6月27日，华为在深圳总部召开新闻发布会，发布了公司第一部创新和知识产权白皮书《尊重和保护知识产权是创新的必由之路》，并呼吁勿将知识产权问题政治化。华为首席法务官宋柳平在发布会上表示，知识产权是创新的基础，将知识产权问题政治化会威胁全球技术的进步。

作为一家技术公司，尊重和保护知识产权是华为经营和发展的一贯原则。发布上华为宣布，过去30年，为合法使用其他公司的专利，华为累计支付了60多亿美元的专利费，其中近80%支付给了美国公司。我们通过签署专利许可或交叉许可协议，与全世界分享自有知识产权，积极促进创新成果产业化。自2015年以来，华为获得的知识产权收入累计超过14亿美元。

Press Release / 新闻稿



Scan to read press release
Huawei releases white paper on intellectual property



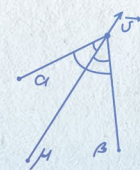
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华为发布创新和知识产权白皮书



“

If politicians use IP as a political tool, they will destroy confidence in the patent protection system. If some governments selectively strip companies of their IP, it will break the foundation of global innovation.

如果知识产权沦为政客的工具，将伤害人们对专利保护制度的信心。如果某些政府选择性剥夺一些公司的知识产权，将会摧毁全球创新的根基。



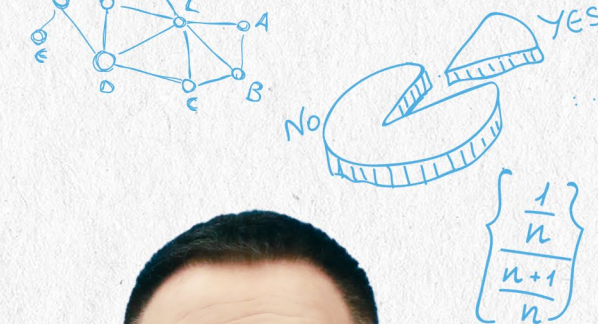
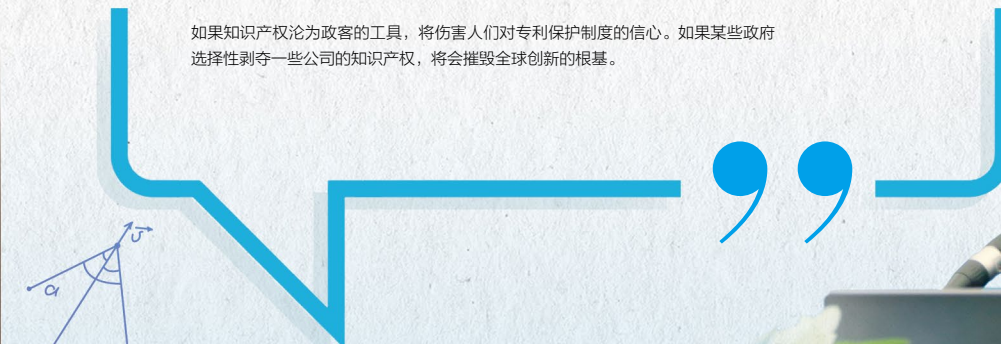
Scan to read
Dr. Song Liuping's full statement



扫码阅读
宋柳平发言全文



Scan to watch video
Touting Importance of Protecting IP Rights



Song Liuping | 宋柳平

Chief Legal Officer, Huawei
华为首席法务官



Vincent Peng | 彭博

Director of the Board, Former Vice President of the Public Affairs and Communications Dept, Huawei
华为董事、时任公共及政府事务部副总裁

“

Huawei's growth can be attributed to the company's ongoing R&D investment and the hard work of our dedicated employees. This is why we're able to have more than 6,000 new patents every year. It is also why we currently hold over 80,000 patents in total, as well as over 20% of the world's 5G standard essential patents. Protecting IP is a basic principle of our business operations. Each year, we require all Huawei employees, both in China and abroad, to sign Business Conduct Guidelines that specify IP protection requirements.

华为的发展靠的是持续的研发投入和员工的艰苦奋斗，这也是我们每年可以产生 6000 多项新专利、拥有多达 8 万多项专利以及拥有超过 20% 5G 核心专利的原因。专利保护精神是华为业务的一个基本准则，公司要求所有员工——包括海外和国内的员工每年签署专包含知识产权保护内容的 BCG（《华为员工商业行为准则》）。

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The white paper elaborates on Huawei's practices in and contributions to innovation and the protection of IPR; how sustained innovation has helped Huawei's success; how Huawei's innovation brings huge social value; and Huawei's stance on the use of third parties' IPR and its own.

这份白皮书详细介绍了华为公司在创新与知识产权保护上的实践与贡献，持续创新如何帮助华为取得成功，华为创新成果的社会价值以及华为在使用他人知识产权和保护自有知识产权方面的立场。

“



Jason Ding | 丁建新

Vice President and Former Head of Intellectual Property Rights Department, Huawei
华为时任知识产权部部长

“

The long-term costs of throwing the international cooperation rules we have developed over the decades would be absolutely immense. We need to bring the debate about international IP back to a matter of facts and away from emotion and political expediency. To do this, we need to strengthen the multilateral rules that govern the exchange of IP across the world.

长远来看，无视我们过去几十年制定的国际合作规则将带来巨大的代价。我们要抛开情绪和政治权宜之计，在有关国际知识产权的辩论上重新聚焦事实问题。这需要强化全世界知识产权交换的多边管理规则。



Scan to watch video
Prof Peter Williamson denounces attacks on Huawei IPR

”



Peter Williamson | 彼得·威廉姆森

Professor, University of Cambridge Judge Business School
剑桥大学贾吉商学院教授

“

If we want to maintain that high, fast-paced level of innovation, we need to bring the ideas out there as soon as they have arrived. Justness and fairness are essential human values that regardless of the context that we work in, regardless whether we work in a technological environment or not, these are principles that matter. Every person and every individual on this planet deserve the right to have their ideas protected and create value for themselves.

如果我们想保持快速的高水平创新，就要敢于提出新想法。公正公平是人类的基本价值观。无论我们工作的背景如何，我们是否从事技术行业，这些原则都至关重要。每一个人的想法都应得到保护，每个人都有权通过自己的想法创造价值。



Scan to watch video
Huawei: Professor David De Cremer touts the importance of IP rights

”



David De Cremer | 戴维·德·克雷默

Former Provost Professor, National University of Singapore and University of Cambridge
时任新加坡国立大学和剑桥大学院长教席教授



George Gilder | 乔治·吉尔德

American investor, writer, economist, and co-founder of the Discovery Institute

美国投资者、作家、经济学家和发现研究所的联合创始人

Huawei Innovation and Intellectual Property White Paper [2019]

华为创新与知识产权白皮书 [2019]



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White Paper on Innovation and
Intellectual Property



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白皮书

Huawei has built a huge repertory of intellectual property. IP invention and human ingenuity are at the heart of the great story of Huawei's rise to becoming a great innovator and pioneer of the world economy.

华为已经建立了庞大的知识产权组合。知识产权和创造力是华为崛起成为全球伟大创新者和先驱的核心因素。



Scan to watch video
Huawei: U.S. economist
George Gilder applauds
Huawei's IP standards



Song Liuping, Vincent Peng and Jason Ding at the conference to respond to questions from media

宋柳平、彭博及丁建新在发布会现场回答记者提问。



PROTECTING IP, DRIVING INNOVATION

02

FORUM ON INNOVATION AND IP PROSPECTS IN 2021

2021年“知识产权：保护科技创新的前进引擎”论坛



Forum on Innovation and IP Prospects in 2021 and Beyond was held at Huawei's Shenzhen headquarters on March 16, 2021. Huawei released a second white paper on innovation and intellectual property, which focuses on Huawei's history in innovation and intellectual property (IP) management prior to 2010 and includes data and milestones related to their investment and R&D that spans back to the 1990s.

Huawei estimated it would receive about 1.2 to 1.3 billion US dollars in revenue from patent licensing between 2019 and 2021. The company announced that for every multi-mode 5G smartphone, Huawei would provide a reasonable percentage royalty rate of the handset selling price, and a per unit royalty cap at US\$2.5.

2021年3月16日, 华为在深圳总部召开“知识产权: 保护科技创新的前进引擎”论坛, 发布了《尊重和保护知识产权是创新的必由之路》创新 and 知识产权白皮书 2020, 重点介绍华为 2010 年之前在创新和知识产权方面的历史实践, 通过历史数据和关键事件, 展现华为从 90 年代创业早期阶段开始的研发和创新历程。

论坛上, 华为公司预计 2019~2021 三年的知识产权收入在 12~13 亿美元之间, 并公布了华为对 5G 多模手机的收费标准: 华为对遵循 5G 标准的单台手机专利许可费上限为 2.5 美元, 并提供适用于手机售价的合理百分比费率。

Press Release / 新闻稿



Scan to read press release
Huawei releases white paper on
intellectual property 2020



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华为发布创新和
知识产权白皮书
2020



LIVE PLAYBACK:

Huawei: Forum on Innovation and IP Prospects in 2021 and the Launch of the Innovation and Intellectual Property White Paper 2020

华为“知识产权: 保护科技创新的前进引擎”, 暨创新和知识产权白皮书 2020 发布论坛直播回放



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Francis Gurry | 弗朗西斯·高锐

Former Director General, WIPO
世界知识产权组织前总干事

IP provides an essential incentive to investment in R&D. It allows the innovator to recover investment in R&D by protecting the competitive advantage that innovation confers....In releasing its license fee structure for 5G standard essential patents (SEPs), Huawei is promoting the widespread adoption and use of standards designed to ensure interoperability, reliability and transparent competition, while at the same time providing a fair return for investment in R&D.

知识产权为研发投入提供了重要的激励。知识产权可以保护创新成果及其带来的竞争优势，让创新者能够尽快收回研发投入成本。华为发布 5G 标准基本专利（SEP）费率，将推动业界广泛采用和使用旨在确保可操作性、可靠性和透明竞争的标准，同时为其研发投入提供公平的回报。



Song Liuping | 宋柳平

Chief Legal Officer, Huawei
华为首席法务官

We want to show the history of our innovation over the past 30 years and our long-term commitment to respecting, protecting, and contributing to IP. With this white paper, we want you to better understand how Huawei has become what it is today.

我们希望通过今天发布的 2020 版白皮书，展示华为公司 30 年来技术创新发展的历程，及公司对知识产权一贯的尊重、保护和贡献。希望它能够更加透明地让大家看见华为是如何一步步走到今天。



Innovation has been at the core of Huawei's business since the company was founded. Our 2020 white paper lists the number of patent applications Huawei filed, or our R&D and innovation activities, in the late 90s and early 2000s. Huawei's worldwide patent applications were on par with other industry leaders in the early 2000s, and Huawei's success today is a result of its long-term investment in innovation and R&D.... Huawei has been the largest technical contributor to 5G standards, and follows fair, reasonable and non-discriminatory (FRAND) principles when it comes to patent licensing. We hope that the royalty rate we announced today will increase 5G adoption by giving 5G implementers a more transparent cost structure that will inform their investment decisions moving forward.

华为实际上从成立之初就是一家非常重视创新的公司。今天列举的华为在 2000 年前后的专利申请数据记录了世纪之初，也就是 20 多年前开始的研发创新活动。与行业内的主要厂商相比，当时的专利申请数量就处于同一水平。华为今天的成功是长期自主创新研发投入的结果……华为作为 5G 标准的重要技术贡献者，遵循 FRAND 原则，我们希望今天提供的信息可以为 5G 技术的实施者提供透明的成本预期，增加投资的确定性，并促进 5G 技术的普及。



Jason Ding | 丁建新

Vice President and Former Head of Intellectual Property Rights Department, Huawei
华为时任知识产权部部长

White Paper on Innovation and Intellectual Property [2020]

华为创新与知识产权白皮书 [2020]



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Roundtable discussion / 圆桌专题讨论

Senior experts and scholars from the global intellectual property field, academia, and innovation field gathered at the forum, focusing on innovation and ecology, combined with Huawei's practice and accumulation in the intellectual property field in the past 20 years. A roundtable discussion was held on the past, present and future challenges, industry trends and impacts of intellectual property.

来自全球知识产权领域、学术界、及创新领域的资深专家、学者汇集论坛，围绕创新和生态，结合华为过去 20 余年在知识产权领域的实践与积累，就知识产权在过去、现在和未来的挑战、行业趋势及影响进行了圆桌专题讨论。



Boy Lüthje | 吕博艺

Senior Fellow, Frankfurt University Institute of Social Research
德国法兰克福大学社会学研究院高级研究员

If we look at what the role of Huawei is in this context and what innovation means in this context, the white paper that is being published today is a very instructive piece on not just technology, patents, and investment but on how innovation is made through the combination of many different things. This, I think, is the most important thing we can learn from this whole story. This paper talks about networking and infrastructure and how to develop infrastructure and how to find the key areas of innovation that are needed for the next steps of developing infrastructure. It does a very good job of explaining this in a mostly untechnical way.

如果想了解华为的创新发挥的作用和价值，今天发布的白皮书可以说非常具有启发性，它讲述了华为的技术、专利和投资的发展历程，以及华为如何通过组合不同元素实现创新，这是我们从中可以学到的最重要的内容。这份白皮书讲述了华为网络和基础设施的发展以及如何确定基础设施未来的发展方向和关键创新领域。这份白皮书用非技术的语言阐明了这些问题。



Eden Yin | 尹一丁

Co-Director for Cambridge Center for Chinese Management
剑桥大学嘉治商学院中国管理研究中心联席主任

This event is of great importance and significance to China and even the world as a whole. Chinese companies need to be very responsible players in the international IP landscape. We need big thinkers. We need blue sky thinking. We need people not only like Ren Zhengfei, but we need entrepreneurs like Jeff Bezos and Elon Musk who do not chase financial returns and look for long-term value, and who want to help society for better. Chinese companies need to send a strong positive signal to the rest of the world, that they are actually responsible players and their technology is capable of being a contributor to global technology improvement. So, they need to get themselves there and connect with people and communicate with the media.

本论坛讨论的话题对于中国乃至整个世界来说都是非常重要的，中国企业要学会如何在国际知识产权领域成为一个负责任的玩家。我们需要梦想家，我们需要天马行空的想法。我们需要的不仅仅是华为的任正非，还有杰夫·贝索斯和埃隆·马斯克这样的人。他们关注的并不是短期的投资回报，而是更长远的价值以及如何让整个社会变得更好。很多中国公司都是非常负责任的市场玩家，他们为技术进步也做出了很多的贡献，因此他们应该更多地与人们沟通，与媒体沟通，讲述他们在这方面的贡献。



Karl Song | 宋凯

Former Vice President of Corporate Communications, Huawei
时任华为企业沟通部副总裁宋凯

Innovation is crucial for technology improvement, just like how the first, second, and third industrial revolutions were driven by the steam engine, electrification system, and information technology. We now find ourselves in the 4th industrial revolution, which is being driven by innovation in IoT, cloud, AI, and big data. We will work with top talent from around the world to address the common problems facing humanity, like how to break the limits currently faced by ICT technologies and push past theoretical limitations. This is not something Huawei can do alone, instead requiring the joint efforts of many.

创新对于技术进步至关重要。正如第一、第二、第三次工业革命分别由蒸汽机、电气系统以及信息技术的革新而推动，而现在，我们正处于第四次工业革命期间，IoT、云、AI、大数据等技术也正被各种创新推动。华为需要和最优秀的人才、全球最顶尖的人才一起解决人类面临的共同难题，比如如何突破 ICT 技术当今的边界，突破理论层面的局限，这不是华为一家公司就可以完成的，实际上依赖非常多的协作。



Broadening the Innovation Landscape

Creating IP, driving innovation

03

2022 Forum on Broadening the Innovation Landscape: Creating IP, Driving Innovation

开拓创新视野：2022 创新和知识产权论坛

**LIVE PLAYBACK:****2022 Forum on Broadening the Innovation Landscape: Creating IP, Driving Innovation**

华为“开拓创新视野：2022 创新和知识产权论坛”直播回放



Scan to watch



扫码观看



The "Broadening the Innovation Landscape 2022" forum was held at Huawei's Shenzhen headquarters on June 8, 2022. It marked the third innovation and IP-themed event Huawei has hosted on its innovation practices.

Huawei announced a batch of key inventions as part of its biennial "Top Ten Inventions" Awards. The award is designed to recognize inventions that could create new series of products, become important commercial features of existing products, or that generate considerable value for the company and the industry.

Huawei announced that In the past five years, more than two billion smartphones have been licensed to Huawei's 4G/5G patents. And for cars, about eight million connected vehicles licensed to Huawei patents are being delivered to the consumers every year. Huawei is also working actively with patent license administration companies in offering "one-stop" licenses for mainstream standards.

Over 260 companies—accounting for one billion devices—have obtained Huawei's HEVC patent licenses through a patent pool. The company is in discussions to establish a new patent pool to give the industry "quick access" to Huawei's patents for Wi-Fi devices worldwide.

2022年6月8日，华为在深圳总部召开“开拓创新视野：2022 创新和知识产权论坛”，这是华为第三次举办创新和知识产权主题活动，并分享其创新实践。

在论坛上，华为公布了在其两年一度的“十大发明”评选活动中获奖的重大发明。该奖项旨在肯定和奖励有潜力开创新的产品系列、成为产品重要商业特性，并为公司和行业带来巨大商业价值的发明或专利技术。

华为公布，过去五年，已有超过 20 亿台智能手机获得了华为 4G/5G 专利许可；目前每年还有约 800 万辆网联车获得华为 4G/5G 专利许可。华为还积极通过主流专利池等组织为业界提供“一站式”许可，方便行业参与者使用其技术和创新成果。

在视频领域，目前已有 260 家厂商、10 亿台终端产品通过专利池获得了华为的 HEVC 专利许可。华为在积极讨论建立新的专利池，期望为更多的 Wi-Fi 设备提供华为专利许可。华为也在与相关机构积极沟通 5G 领域的联合专利运营方案。

Press Release / 新闻稿

Scan to read press release
Huawei Announces New Inventions
That Will Revolutionize AI, 5G, and
User Experience



扫码阅读新闻稿
华为公布“十大发明”
评选成果，将对人工
智能、5G 和用户体验
带来深远影响



INNOVATOR / 发明人

Yunhe Wang | 王云鹤

Senior Researcher, Noah's Ark Lab,
2012 Labs, Huawei
华为 2012 实验室诺亚方舟实验室高级研究员

Innovator, Novel Multiplier Architectures
and Adder Neural Networks with High
Computing and Energy Efficiency.

“大幅提升算力的高效能乘法器和加法神经网络” 发明人

**Xi Zheng** | 郑熙

Networking and User Experience Lab,
GTS, Huawei
华为全球技术服务部网络体验实验室

Innovator, Simulated Reality of
Communication Networks (SCRON)

“通信网络模拟现实 (SCRON)” 发明人

**Siyuan Cheng** | 程思源

Senior Engineer, 2012 Labs, Huawei
华为 2012 实验室高级工程师

Innovator, Behavior Decision Method
for Autonomous Vehicles Considering
Multi-object Interaction.

“基于多目标博弈的智能驾驶决策方案” 发明人



HUAWEI'S “TOP TEN INVENTIONS”

华为第四届“十大发明”

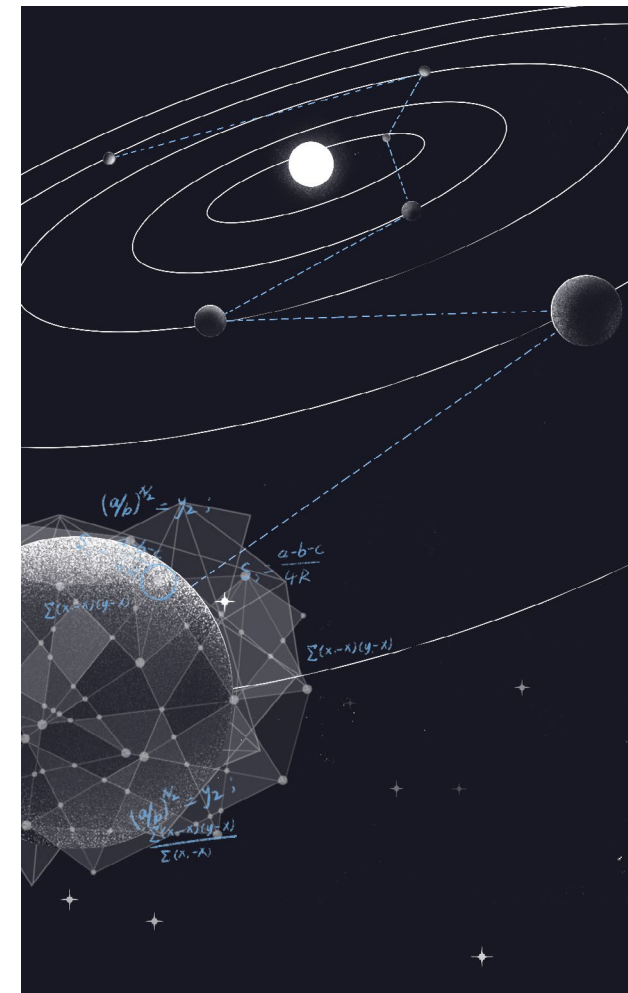
01

Novel Multiplier Architectures and Adder Neural Networks with High Computing and Energy Efficiency

This patent includes an all-new Adder Neural Network that goes beyond the constraints of existing AI computing frameworks to solve difficult mathematical bottlenecks in AI. It can reduce computing power consumption and circuit size by more than 70%, and support all-scenario AI application. This technology can also allow consumer electronics to save power when using AI functions.

大幅提升算力的高效能乘法器和加法神经网络

该项专利中包含了一种新型加法神经网络，突破现有的 AI 计算框架，解决了 AI 领域的数学难题，可使计算功耗和电路面积下降到 70% 以上，赋能 AI 在各个场景落地。专利包相关技术带来的优化，可以使电子消费产品在使用 AI 功能时大幅省电。





Kite-like Solution

This solution helps carriers use public networks to meet the varied requirements of 5G networks across different industrial scenarios. It ensures that services are not interrupted when individual networks go down, and that local data is kept within campuses to meet security requirements. The highly reliable private networks enabled by this solution have been deployed in multiple mining sites, where it enables autonomous operations.

Behavior Decision Method for Autonomous Vehicles Considering Multi-object Interaction

This technology resolves some of the foremost challenges in autonomous driving, including positioning, perception, and decision-making challenges in complex urban road scenarios where people and vehicles are mixed. Our invention resolves 70%+ of challenges in these interactive scenarios and shortens vehicle pass-through time by 40%+. It also cuts computing power usage by 87.5%, reduces CPU usage by 85%, and slashes storage overhead by 200 times.

风筝方案

该项专利包助力运营商公网专用，匹配不同行业的 5GtoB 建网诉求，在网络中断情况下，业务也不会中断，同时实现本地数据不出园区，满足安全性需求。该专利包的高可靠专网已落地中国多家煤矿，助力煤矿无人化稳定运行。

基于多目标博弈的智能驾驶决策方案

该项专利包解决了城市道路人车混杂的复杂场景里，自动驾驶的定位、感知及决策问题。专利包的核心亮点特性已完成商业落地。多目标博弈决策框架解决交互场景接管难例 70%+，缩短通行时间 40%+；感知网络算力消耗降低 87.5%；轻量化定位降低 CPU 消耗 85%，缩小存储开销 200 倍。



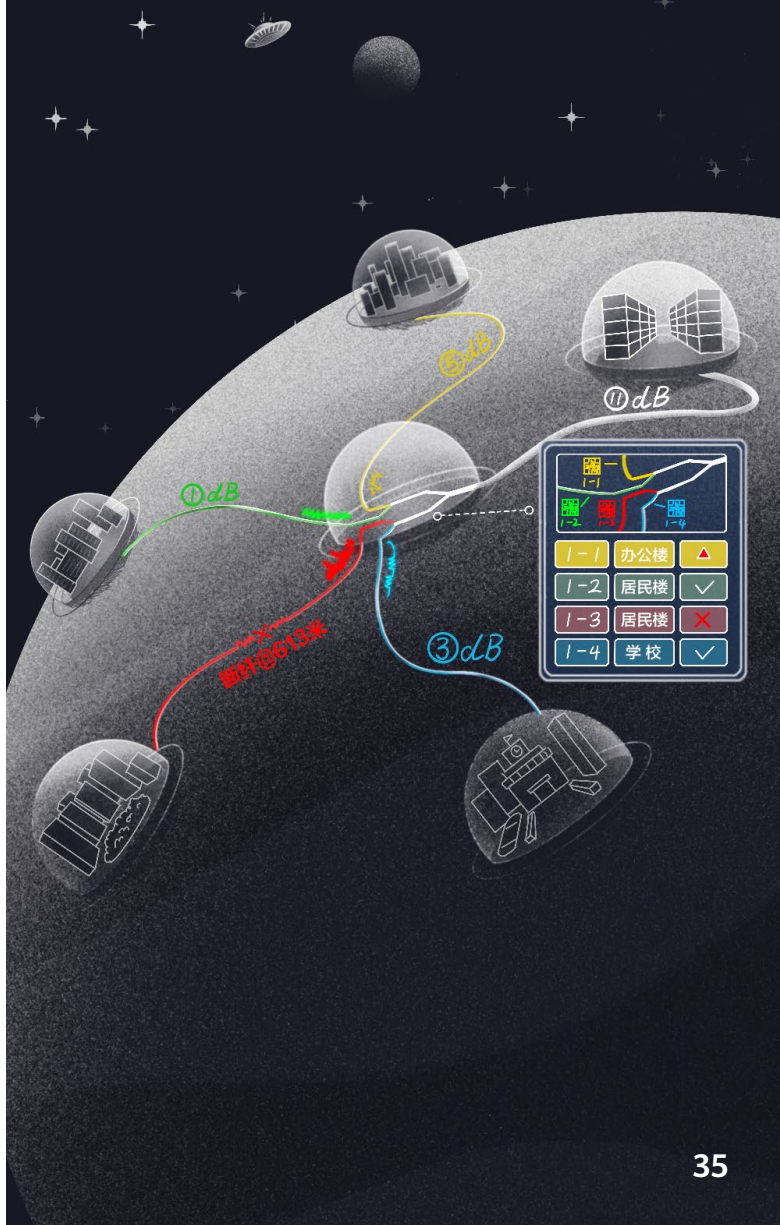
04

Digital QuickODN

Optical distribution networks, or ODNs, serve as the underlying infrastructure for fiber broadband. The passive nature of optical fibers makes them difficult to manage and maintain. Achieving the digital management of optical fiber has been a decades-long struggle, ever since they were first invented by Charles Kao. Our Digital QuickODN solution enables just that by marking an "optical iris" on fibers, akin to a QR code for each connection. This innovation makes it possible to intelligently and digitally manage and maintain ODN networks. This means fiber broadband can be planned and deployed faster and more accurately and faults can be more easily located and rectified, making the O&M of ODNs 30%+ more efficient.

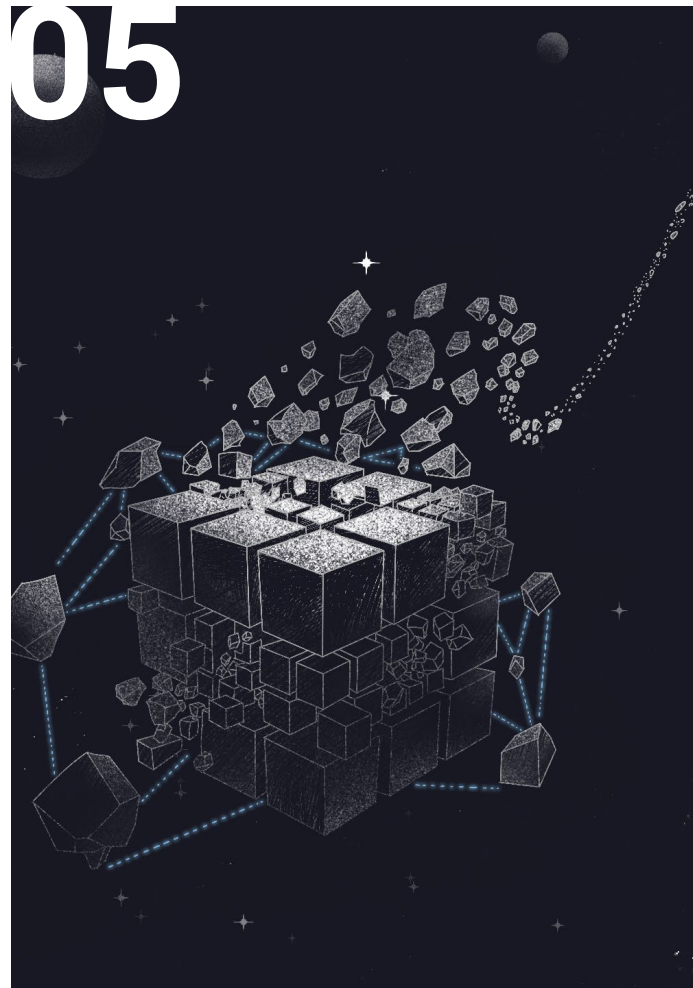
数智光分配网

光分配网（ODN）是光纤宽带的基础设施，光纤的无源特性，使其管理和维护非常困难。DQ ODN（数智 ODN）方案，解决了自高锟先生发明光纤以来困扰业界几十年的海量 ODN 光纤无法数字化管理的难题。该项专利通过在光纤上刻写光虹膜，给光信号打上了“二维码”，为运营商构建了数字化、智能化 ODN 资源管理和运维机制，实现了光纤宽带网络的精准规划与快速部署，故障的精准定位与快速修复，ODN 运维效率提升 30% 以上。



Iteration-based Full-packaged Precision Floating-point Unit

This technology enables a more flexible mix of computing precision and computing power. It can meet varying requirements for floating-point precision computing in scenarios from high-performance computing to AI training and inference that need large computing power. It has already been incorporated into our next-generation Ascend and Kunpeng chips and provides 2x computing power for AI training and inference compared with industry counterparts. The HPC + AI hybrid precision computing has become the latest direction of research within academia and industry, and the full-precision computing unit has also become critical to the success of the computing industry.



基于叠代的全精度浮点单元

该项专利包在芯片算力层面创新地保障了更灵活的计算精度与算力配比，完美的解决了 HPC、AI 训练、AI 推理等多样场景多种浮点精度计算的大算力需求。专利包的应用已在下一代昇腾与鲲鹏芯片中，其 AI 训练与推理算力是友商标杆产品的 200%+，HPC 和 AI 的混合精度计算也成为国内外学术界和产业界的最新技术方向，全精度的计算单元已成为计算产业致胜的关键。

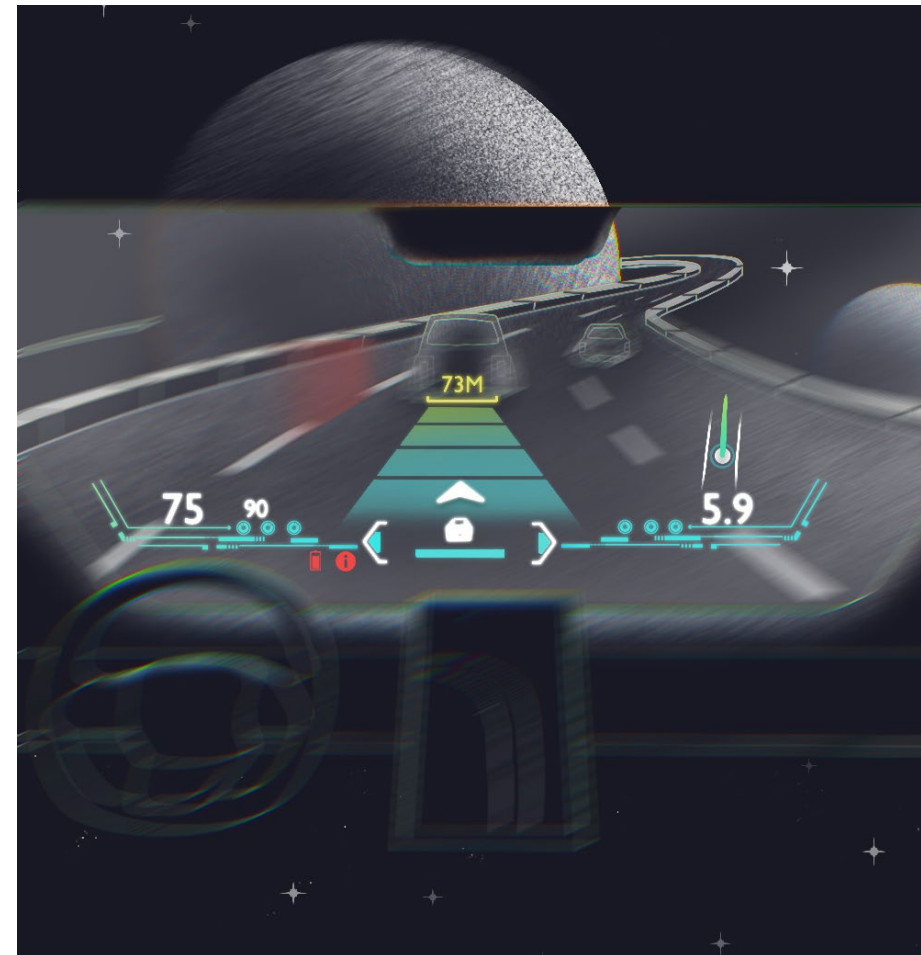
06

High Density & Large Image Innovative AR-HUD Solution

This compact, high-density, large-image AR head-up display (HUD) is built on innovative optics and algorithms. It solves issues with image distortion and vertigo commonly found in automotive head-up display systems due to limited size. The AR HUD turns the windshield into a screen that integrates all types of information while ensuring security. Its Optical Display Processor (ODP) defines the next generation of HUDs, offering a brand-new intelligent driving experience.

高清、大画幅创新 AR-HUD 解决方案

该专利包采用创新的光学和算法方案首次实现了业界小体积、大画幅、高清 AR HUD（虚拟现实叠加抬头显示）。同时，通过创新光学技术在最小体积约束下，解决图像畸变和眩晕等业界难题。AR HUD 将前挡风玻璃化身集科技感、安全性、娱乐性于一体的智能信息“第一屏”，以全新的 ODP（Optical Display Processor，光显示处理器）技术开创影视级高清 HUD 新代际，大幅提升智能驾乘新体验。



07

BladeAAU Base Station Antenna Minimalist Deployment Solution and Indoor Distributed Massive MIMO Solution

This innovation addresses major challenges in indoor and outdoor 5G deployment. For outdoor scenarios, we have developed the See-through Antenna that can accommodate different antenna units that work on different frequency bands, and our BladeAAUs simplify 5G network deployment while ensuring optimal 2G, 3G, 4G, and 5G network performance. The solution has helped more than 10 carriers accelerate 5G network deployment. For indoor scenarios, Distributed MIMO greatly improves 5G network capacity and user experience. This solution has been deployed by the National Centre for the Performing Arts of China, the Wuhan Metro, and the Chengdu East Railway Station, significantly improving 5G performance and experience.

BladeAAU 基站天线极简部署方案与室内分布式 Massive MIMO 方案

该项专利包解决了室内外 5G 部署的重要挑战。在室外，首次突破电磁透明技术解决多频段天线模块化的共存难题，通过首创一体化 BladeAAU 形态助力客户极简部署 5G 网络。其价值在于使能客户快速部署 5G Massive MIMO，并同时保证 2/3/4/5G 网络性能最优；已助力全球十多个运营商加速 5G 网络部署。在室内，通过 D-MIMO 技术大幅提升 5G 网络容量和体验，已应用于国家大剧院、武汉地铁、成都东火车站等不同场景，用户 5G 性能和体验倍增。



5G Single Air Solution for Dynamic Spectrum Sharing

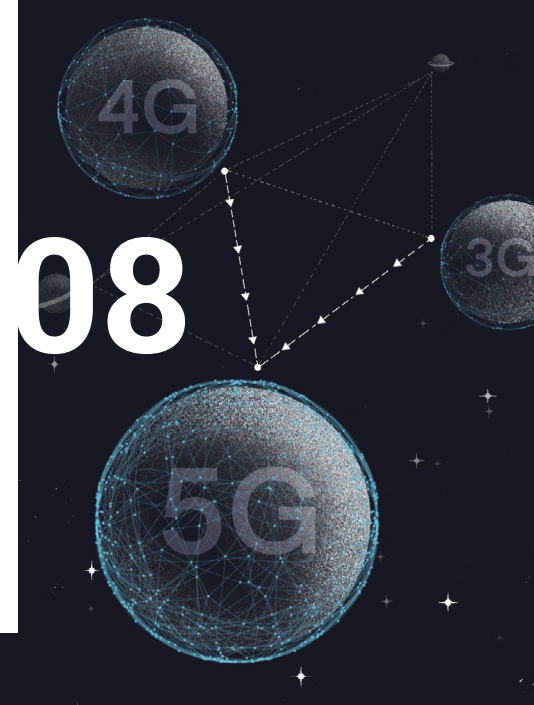
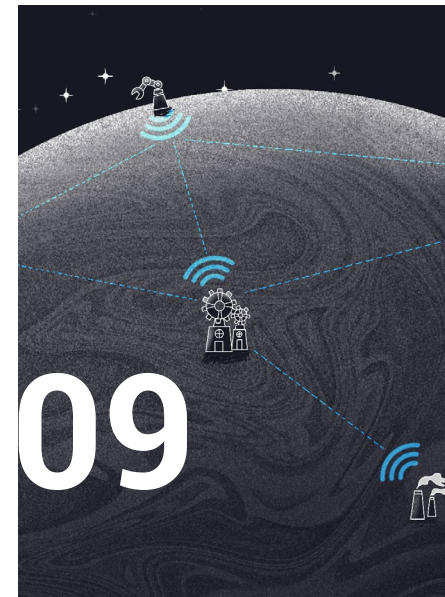
As a 5G standard essential patent, the solution increases the proportion of inter-RAT spectrum resource sharing from 40% (during the 4G era) to 90% (for 5G). It is the industry's only millisecond-level dynamic spectrum sharing solution that's ready for commercial use. The solution is currently used commercially in 26 networks, with unmatched performance and deployment speeds.

Deterministic IP

This innovation enables deterministically low latency and low jitter for large-scale packet networks. Based on this, we were able to release the industry's first and only deterministic IP network solution. It has passed the world's first trial of deterministic wide area networks and wide-area cloud-based PLCs, enabling reliable, microsecond-level latency in remote industrial control scenarios. As the technological foundation, deterministic IP networks support emerging industry applications such as industrial control, connected vehicles, smart grids, telemedicine, Cloud VR, and holographic communications that require deterministically low latency and low jitter, enabling the next-generation industrial Internet.

动态频谱共享 5G Single Air 方案

作为 5G 标准必要专利，该专利包将 5G 跨制式频谱资源的共享比例从 4G 时代的约 40% 提升到 90%，实现了业界唯一的毫秒级动态频谱共享商用能力。目前全球已成功商用 26+ 局，性能和节奏大幅领先业界。



确定性 IP

该专利包首次实现了大规模分组网络的确定性低时延、低抖动，发布了业界独家确定性 IP 网络解决方案，完成了全球首个确定性广域网创新试验和广域云化 PLC 试验，实现了微秒级精度的远程工业控制。其价值在于，作为基础技术底座，支撑工业控制、车联网、智能电网、远程医疗、Cloud VR、全息通信等新兴产业应用对网络确定性低时延、低抖动的需求，使能下一代产业互联网。



10

Storage AA Cluster Solution with Globally Balanced Expansion and High Reliability

This invention makes significant breakthroughs in storage speed, stability, and scalability, enabling a symmetric active-active high-end storage architecture with zero service interruptions. This architecture supports sub-millisecond latency and storage speeds of over 10 million input/output operations per second (IOPS). These features will allow it to play a crucial role in addressing key challenges that arise in various real-world scenarios that can lead to data bursts. Examples include the data bursts seen in the train booking systems during the Chinese Spring Festival, the storage of massive amounts of data in a short period of time on controlled explosions during oil exploration, and the surges in orders that regularly strain banking systems during the busiest online shopping days.

存储全局均衡扩展高可靠 AA 集群方案

此专利包从更快、更稳、弹性扩展三个方面实现存储价值的突破，实现业务零中断的全局对称 A-A 双活高端存储架构。在应对实际业务 Burst 高峰拥堵场景时，如过年时交通订票结算系统高峰访问，能源石油勘探爆破时数据短时间集中存储需求，双十一下单量剧增导致银行结算系统业务高峰等，都需要应用亚毫秒级低时延、千万级高性能、全局对称双活的高端存储 AA 专利。

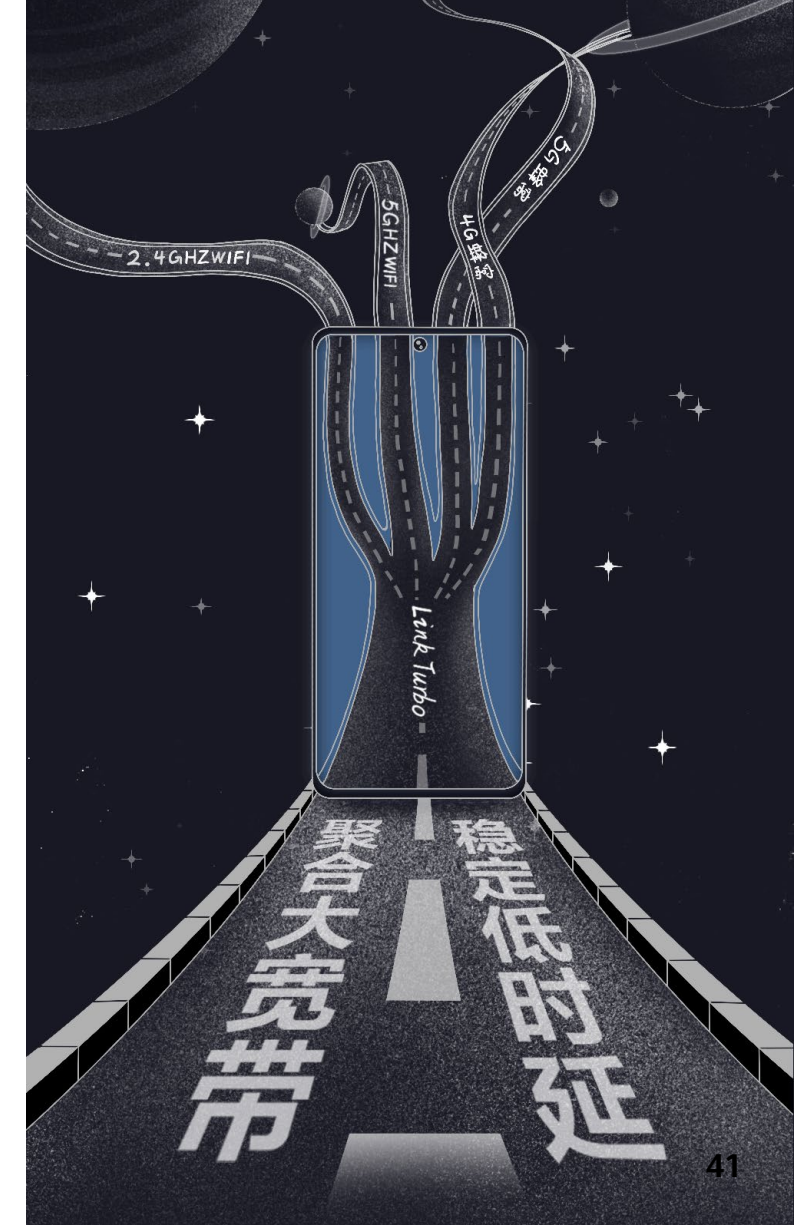
11

Harmony LinkTurbo (Network Aggregation Acceleration) & HyperHold (Memory Expansion)

This patent portfolio reveals the innovative network and memory technologies widely used in Huawei device products, including the multi-network aggregation technology, LinkTurbo, for Wi-Fi and cellular networks (such as 4G and 5G mobile networks), and the dynamic memory-expansion technology HyperHold. LinkTurbo uses software only to stack and integrate the capabilities of multiple network modules. Using complementary multi-network capabilities, LinkTurbo improves concurrent download speeds by 83%, reduces gaming latency by 69%, and cuts video buffering time by 87% when there is limited network access or jitter, or for mission-critical services. HyperHold significantly expands available memory, reduces frame freezing caused by frequent memory swapping, improves basic read/write performance, and delivers an extraordinarily smooth user experience.

鸿蒙网络聚合加速与内存扩展

该项专利包揭示了在华为终端产品上广泛使用的网络与内存革新技术——包括终端产品上 Wi-Fi、蜂窝的多网融合 LinkTurbo 技术以及内存动态扩展 Hyperhold 技术。LinkTurbo 以纯软件方案将多个网络模组的能力堆叠融合，在网络受限、抖动以及关键业务场景下，并发下载速率提升 83%，游戏时延降低 69%，视频起播时延下降 87%，多网协同能力互补，“拳头攥在一起力量更强”；Hyperhold 大幅扩展可用内存，减少低内存频繁换入、换出引发的卡顿，提升基础读写性能，为用户带来极致流畅体验。





Keynote speaker quotes / 主讲人

Keynote speakers at the forum included Tian Lipu, President of International Association for the Protection of Intellectual Property (AIPPI) China and former Commissioner of the China State Intellectual Property Office; Manuel Desantes, Former Vice President of the European Patent Office; and Liu Hua, director of World Intellectual Property Organization Office in China.

国际保护知识产权协会中国分会会长、原中国国家知识产权局局长田力普、原欧洲专利局副局长曼努埃尔·德桑特斯和世界知识产权组织（WIPO）中国办事处主任刘华在论坛进行了主题发言。

“

In the future, competition will be over intellectual property. Over the past few years, Huawei has found itself under huge external pressure. Despite this, it has not been crushed; instead, the company has grown stronger than ever and inspired more Chinese companies to pursue innovation. This demonstrates Huawei's global competitiveness in the field of IP.

世界未来的竞争就是知识产权的竞争。华为近几年来在巨大的外部压力下，不仅没有被压垮，而且更加强壮，还附着激发了国人的自主创新意识，这就是华为在知识产权领域强大国际竞争力的具体体现。

”

Tian Lipu | 田力普

President of International Association for the Protection of Intellectual Property (AIPPI) China, and former Commissioner of the China State Intellectual Property Office

原中国国家知识产权局局长

“

Our Intellectual Property system rewards the novatio, but not the in-novatio. In-novatio is about knowing how to bring new things into the market for the benefit of society. In this new cognitive era, what really matters is not the novatio, but the in-novatio. What matters is no longer how many inventions or how many patents we manage to register, but how to ensure that all human beings and all our societies benefit from the results of such inventions and such patents.

我们现有的知识产权制度奖励的是 Novatio，而不是 In-novatio。In-novatio 意味着需要知道如何将新事物带入市场，造福社会。其实，我们当前所处的这个新的认知时代，真正重要的不是 Novatio，而是 In-novatio。换言之，重要的不再是我们注册了多少发明或多少专利，而是如何确保所有人、所有社会都从这些发明和专利的成果中受益。

”

Manuel Desantes | 曼努埃尔·德桑特斯

Former Vice President, European Patent Office

原欧洲专利局副局长

“

In the globalized era that we live in, the importance of openness and cooperation in innovation is self-evident. Open innovation depends on an institutional environment that nurtures, protects, and spurs innovation. As the UN agency that oversees IP and innovation, we welcome China's deeper participation in global cooperation on IP governance. Together, we want to build a more open, balanced, inclusive, and vibrant global IP ecosystem.

在全球化时代，开放与合作对创新的重要性不言而喻。开放式创新依赖于不断培育、保护和激励创新的制度环境。作为联合国负责知识产权和创新的专门机构，我们欢迎中国深度参与全球知识产权治理合作，共同打造一个更加开放、平衡、包容和充满活力的全球知识产权生态体系。

”

Liu Hua | 刘华

Director, World Intellectual Property Office, China
世界知识产权组织（WIPO）中国办事处主任



Song Liuping | 宋柳平

Chief Legal Officer, Huawei
华为首席法务官

Protecting IP is key to protecting innovation. We are eager to license our patents and technologies to share our innovations with the world. This will help broaden the innovation landscape, drive our industry forward, and advance technology for everyone.

华为愿意在全世界范围内提供专利与技术许可，与全球分享科技创新的成果，共同开拓创新视野和思路，从而促进产业发展和技术进步。

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樊志勇 | **Alan Fan**

Vice President and Head of Intellectual Property Rights Department, Huawei
华为副总裁、知识产权部部长

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Starting in 2015, to honor the remarkable achievements of our innovators, Huawei has given “Top Ten Inventions” Awards every other year. The award is designed to recognize inventions or patented technologies in three areas:

One: The invention creates a new product series. Two: The invention powers a breakthrough feature in an existing product. Or three: It generates considerable value for the company and the industry. As the organizer of the Awards, it's exciting to see the commercial, industrial, and social value that our innovations can create.

为了奖励发明人取得的突出成就，从2015年起，华为每两年举办一次“十大发明”的评选活动。评选的宗旨是奖励那些未来有潜力开创新的产品系列、成为产品重要商业特性、为公司和行业带来巨大商业价值的发明或专利技术。作为这项评选活动的组织方负责人，我很开心看到这些创新成果所带来的商业价值、产业价值和社会价值。

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Panel Discussion: IP and Open Innovation under Shifting Global Tech Dynamics



Panel Discussion / 专题研讨

“IP and Open Innovation under Shifting Global Tech Dynamics”

“重构格局下的科技创新与知识产权保护”

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I think that the world today is facing many challenges and these challenges are of a very different nature. The pandemic is still a great example. The only way that I reckon we can, as humanity, address these challenges is innovation. And so, to support innovation we also need to support and have a strong patent system. Therefore, I think that it really comes down to how can we transact efficiently in the market.

当今世界正面临诸多挑战，这些挑战的性质截然不同，而新冠疫情仍然是一个很好的例子。人类唯有创新，才能更好地应对这些挑战，因此为了支持创新，我们还要去支持建立一个强大的专利制度，说到底就是如何在市场上高效地进行交易。

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Mattia Fogliacco | 马蒂亚·弗格里亚科

President, Sisvel
西斯威尔公司总裁

海因茨·戈德尔 | **Heinz Goddar**

Partner, Boehmert & Boehmert and former president, Licensing Executives Society International (LESI)

博默特知识产权律师事务所合伙人、原国际许可证贸易执行协会主席



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Since TRIPS came into the trade related intellectual property provisions of the GATT, the General Agreement on Tariffs and Trade, we know why we should have strong patents. I think the more patents and the less protection, if I may say so provocatively, the better for innovation, creation, and sharing. Strong patents provide benefits and are necessary to create tradable goods from innovations, which you can sell, license, and allow others to share.

自从与贸易有关的知识产权协定（TRIPS）纳入了关贸总协定，我们就开始意识到为什么需要拥有强大的专利。恕我直言，专利越多，保护越少，就会越有利于创新、创造和共享。强大的专利可以带来很多好处，而且从创新成果中产生可交易的产品，你可以售卖、许可或者与他人共享。

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帕特里克·奈斯 | Patrick Nijs

Co-founder of European Union-China Joint Innovation Center (Beijing-Brussels) and former Belgian Ambassador to China

欧盟 - 中国联合创新中心（北京 - 布鲁塞尔）
联合发起人、比利时前驻华大使



I think the challenges that we have ahead are much bigger than we are anticipating today. So, there is potential in the innovation system to help in facing these challenges, provided that we are actually moving the system from a protection system to a system that we really use to share to make value for everyone, which will create common bests for all of us in order to face the immense challenges we have ahead of us. We need to think and bring a solution to the question: How can I lead the IP system in order to serve not particular interests but the creation of global goods that can help all of us to escape extinction in a way.

我们未来所面临的挑战远比我们现在能够预测的要大得多。创新制度有可能能够帮助我们应对这些挑战，但前提是要将这个制度从一个保护制度转变为一个让所有人都受益的分享制度，这样我们才能应对未来巨大的挑战。我们要探讨如何引导知识产权制度的发展，让它不再只是服务于某个利益群体，而是能够支持全球福祉的发展，从而能够让每个人都从中受益。

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We recognize that intangible assets have indeed become a driving force in value seen even today, which is demonstrated by the figures, and we recognize the importance of this in the new economy. And it's playing a significant role as a driver of value in business. Mankind has long used the IP system which includes patents to incentivize innovation, leading to the rapid technological advances seen in modern times, as demonstrated over the last 100 years. The nonphysical nature of intellectual assets from innovations and the infinite scalability of these assets across geographical boundaries means a clear system is needed to identify, protect, own, and monetize these assets.

我们已意识到，无形资产已经成为了价值创造的主要驱动力，从相关数据中可以看出这一点。我们也意识到在新的经济环境下，无形资产很重要，在商业价值创造中扮演了非常重要的角色。人类使用知识产权制度，包括专利制度，来给创新以奖励，进而推动了过去 100 年的技术快速发展。创新成果转化而来的知识产权不具有物理属性，这些资产可以跨越地理边界无限地被扩展，这意味着我们需要有一个清晰的制度来识别、保护、持有和变现这些资产。

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Audrey Yap | 叶淑敏

Managing Partner, Yusarn Audrey and former president, Licensing Executives Society International

山黛丽律师事务所合伙人、原国际
许可证贸易执行人协会主席

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Please watch / 敬请观看



The future is here, or nearly. Innovation is at the core of Huawei. This video features inventions patented by Huawei that will soon make our daily lives better.

视频“程序员的灵感”讲述华为的创新发明如何在不久的将来让我们的日常生活变得更好。

Scan to watch video
扫码观看



In this video, some of Huawei's top China-based researchers explain what challenges they tackle and how their discoveries will make lives better.

视频中，华为顶尖中国研究人员代表解释了他们如何应对科研挑战，致力于用他们的发明，让生活变得更好。



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