






# Lux 299 Top Innovations<sup>BETA</sup>






The technologies that will change the world, according to Lux Research's analysts and data scientists.






## **METHODOLOGY:**


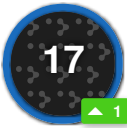



The Lux Tech 299 is our list of the most impactful innovations to track and potentially act upon, ranging from well-known technologies to under-the-radar, up-and-coming opportunities. The methodology behind this list... comes from Lux Research's proprietary data science algorithms, which analyze innovation data like patents, academic papers, various funding types, news, and more, to continually monitor and rank the state of innovation. The list and the associated research updates daily.









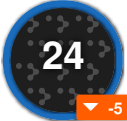




You can filter the below by the overall ranking, or by other metrics like how mature the technology is or how quick-growing in innovation interest it is. Where available, full Tech Pages on each technology are linked to. If you have questions about the methodology or where other technologies not on the Lux Tech 299 fall, please contact us.





RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<b>Deep Learning</b> <span>Tech Page available</span> Advanced machine learning techniques making use of neural networks, for much-improved computer vision, speech recognition, filtering, and more. <b>Recent research:</b> <a href="#">Graphcore: Develops processor for machine intelligence workloads</a>	+75%	3
	<b>Low-Power Wide-Area Networks (LPWAN)</b> <span>Tech Page available</span> Long-range wireless communications for low-power devices. <b>Recent research:</b> <a href="#">Eleven-x: LoRa-enabled communication modules for adding connectivity to assets</a>	+32%	3
	<b>Machine learning and artificial intelligence (AI)</b> <span>Report available</span> Ability of machines to perform complex tasks that have historically required human thinking; includes machine learning (like neural networks and deep learning) and symbolic reasoning (like expert systems). Deep learning is a subset of this broader machine learning and AI topic. <b>Recent research:</b> <a href="#">Machine learning for data entry startup HyperScience raises another \$30 million</a>	+22%	5
	<b>5G Networks</b> <span>Tech Page available</span> Fifth-generation mobile network technology spanning new devices, 5G-enabled business models, as well as operators and companies supporting and developing 5G-related innovations. <b>Recent research:</b> <a href="#">2018 IIoT recap: 5G and IoT security steal the spotlight, while platforms and hardware catch up to market demands</a>	+44%	3
	<b>Blockchain</b> <span>Tech Page available</span> Distributed database technology that securely maintains a growing ledger of transactions, potentially useful for its inherent security, data integrity, and decentralized nature. <b>Recent research:</b> <a href="#">Open Health launches a feature where patients can monetize their data</a>	+172%	2

RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<b>Autonomous Vehicles</b> <span>Tech Page available</span> Integrated system of environmental perception sensors, edge processing hardware, real-time decision-making software, and connectivity that enables assistive features, partial autonomy, and full autonomy in consumer and commercial vehicles. <b>Recent research:</b> <a href="#">RightHook: Simulation software platform for autonomous vehicles</a>	+25%	3
	<b>Connected Cars</b> <span>Tech Page available</span> Integrated system of vehicles, infrastructure, and cloud platforms that use connectivity to provide entertainment, performance monitoring and management, and safety features and services in consumer and commercial vehicles. <b>Recent research:</b> <a href="#">Qualcomm to test C-V2X technology on Las Vegas roads</a>	+10%	3
	<b>Lidar</b> <span>Tech Page available</span> Laser-based 3D sensing technology that enables precise mapping and real-time environmental perception capabilities in applications like autonomous vehicles, future factory, and commercial drones, to name a few. <b>Recent research:</b> <a href="#">Opsys Technologies – Lidar: Solid-state lidar for autonomous vehicles</a>	+13%	3
	<b>Edge Computing</b> <span>Tech Page available</span> Software and hardware technologies that allow for performing computations at the location where data is generated. <b>Recent research:</b> <a href="#">Huawei launches 7 nm Kunpeng 920 chip for big data and distributed storage applications</a>	+72%	1
	<b>Heads-up displays (HUDs)</b> <span>Report available</span> <b>Recent research:</b> <a href="#">DigiLens: Waveguide optics for augmented reality head-up displays</a>	+6%	3

RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<b>Cryptocurrencies (including Bitcoin, Ethereum, and Litecoin)</b> <a href="#">Report available</a> Decentralized and encrypted digital currencies, based on distributed ledger technology (typically blockchain). <b>Recent research:</b> <a href="#">LO3 Energy: Blockchain-based transactive energy systems and distributed heat and computing</a>	+41%	2
	<b>Vehicle-to-vehicle (V2V)</b> Communication between vehicles, through the wireless exchange of vehicle information like the speed and position of surrounding vehicles. <b>Recent research:</b> <a href="#">Autotalks: Vehicle-to-vehicle and vehicle-to-infrastructure communication chipsets</a>	+10%	3
	<b>2D materials</b> Single-layer and crystalline materials, including graphene but also related two-dimensional materials like boron nitride and transition metal dichalcogenides. <b>Recent research:</b> <a href="#">Brookhaven National Laboratory scientists advance single-crystal borophene production</a>	+37%	2
	<b>Quantum computing</b> <a href="#">Report available</a> Computers that use quantum bits (qubits), which thanks to superposition and entanglement can lead to much faster processing speeds than classical computers, for applications that range from cybersecurity to finance to machine learning. <b>Recent research:</b> <a href="#">Rigetti Computing: Quantum computing with superconducting circuits</a>	+10%	2
	<b>Future Mobility</b> <a href="#">Tech Page available</a> Innovations in mobility outside of conventional ownership, such as car-sharing, ride-hailing, autonomous taxis, and other mobility-as-a-service advances. <b>Recent research:</b> <a href="#">Grab: Singapore-based ride-hailing and sharing mobility service provider</a>	+19%	2

RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<b>Solid-State Batteries</b> <span>Tech Page available</span> Next-generation battery chemistry that replaces conventional liquid electrolytes with solid ion-conducting materials like polymers and ceramics, thereby increasing energy, improving safety, and potentially lowering costs. <b>Recent research:</b> NanoGraf Technologies: Developer of high-capacity/high-rate silicon/graphene composite anodes for Li-ion batteries	+25%	2
	<b>Chatbots and virtual assistants</b> <span>Report available</span> A platform that includes a chatbot with conversational capabilities associated with a hardware device, incorporating natural language processing and having access to the internet to perform tasks. <b>Recent research:</b> SoundHound Inc.: Virtual assistant and SDK	+44%	1
	<b>Microbiome</b> <span>Tech Page available</span> Microbes (and their genes) that can be used as ingredients, therapeutics, and health biomarkers across a wide range of industries. <b>Recent research:</b> Whole Biome: Microbiome health company focusing on medical foods	+27%	2
	<b>MicroLED</b> <span>Tech Page available</span> Micro-sized LEDs used as emitters in displays and as backlighting for LCD panel displays. <b>Recent research:</b> The unanswered opportunity of microLED displays	+14%	1
	<b>Vehicle-to-infrastructure (V2I)</b> Set of technologies that aim to link cars and trucks to their physical surroundings like road markings and signs, for safety and efficiency purposes. <b>Recent research:</b> Autotalks: Vehicle-to-vehicle and vehicle-to-infrastructure communication chipsets	+19%	2

RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<b>Electrocatalysts</b> <a href="#">Report available</a>  We don't have much content on this technology yet. Interested? Contact your Client Engagement Manager to express your interest in Lux Research covering this technology more.	+5%	
	<b>Digital twins</b> Matching a physical object with a digital representation of itself that is kept as detailed and up-to-date as possible, to collect and model precise information regarding the use and performance of complex physical objects. <b>Recent research:</b> <a href="#">Hashplay: Uses AI to generate AR/VR-compatible digital twins</a>	+52%	
	<b>Photopolymer resins</b> <a href="#">Report available</a>  Resins that are light-activated to change properties, like hardening via cross-linking, with applications in 3D printing, dentistry, medicine, and more. <b>Recent research:</b> <a href="#">Formlabs: Developer of desktop professional stereolithography 3D printers</a>	+34%	
	<b>Digital light processing</b> <a href="#">Report available</a>  A 3D printing process for photopolymers, using a conventional light source like an arc lamp, for improved speed, lower running costs, and less waste. <b>Recent research:</b> <a href="#">NewPro3D: Developer of digital light processing (DLP) 3D printer</a>	+38%	
	<b>Fleet management</b> <b>Recent research:</b> <a href="#">Ridecell: Fleet management software for ridesharing and carsharing</a>	+7%	

RANK	TOPIC	CHANGE IN INNOVATION INTEREST	RESEARCH AND PATENT ACTIVITY
	<p><b>Li-Fi</b> <a href="#">Report available</a></p> <p>High-speed wireless communication (transfer of data) using light, between physically separate devices.</p> <p><b>Recent research:</b> "Cord-Cutting" in the Enterprise: A Guide to Wireless Communications in Industry 4.0</p>	+36%	1
	<p>Natural text generation and natural language generation (NLG)</p> <p><b>Recent research:</b> Arria NLG: Provider of a natural language generation platform that converts data to reports</p>	+14%	1
	<p>Nickel cobalt aluminum cathodes (NCA cathodes) <a href="#">Report available</a></p> <p><b>Recent research:</b> NanoGraf Technologies: Developer of high-capacity/high-rate silicon/graphene composite anodes for Li-ion batteries</p>	+29%	1
	<p>Haber-Bosch catalysts</p> <p>Materials to accelerate chemical reactions in the Haber process, which is an artificial nitrogen fixation process widely used to make ammonia fertilizers.</p> <p>We don't have much content on this technology yet. Interested? Contact your Client Engagement Manager to express your interest in Lux Research covering this technology more.</p>	+25%	1