Drones Patent Insights Report: The Last Five Years

2025/04/15

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Data Range

Searched from 172 authorities and found 25,588 INPADOC families

Dataset

Keywords/Query: PBD:[20190401 TO 20241231] AND TAC_ALL:(("無人機" or "Drones" or "UAVs" or "Rotary-wing Drones") OR ("Unmanned Aerial Vehicle" or "Fixed-wing drone") OR ("四旋翼" or "Quadcopter") OR ("垂直起降" or "VTOL") OR ("混合翼" or "Hybrid wing"))

Analysis Preferences

Data Grouping: One representative per INPADOC family

Stemming: On

Innovation Profile

Application and Issued Trend

Analyze the annual application trend of the technology. This chart shows the number of grants or issued patents resulting from applications filed in the same year. This is helpful for understanding the rate of applications over a period of time, whether the technology is recent, or whether it is heading towards stagnancy. The grant rate is useful to understand the date from which the technology protection is established and the rate of successful applications over a period of time. Blue represents the application trend and green represents the trend of issued patents resulting from applications of the same year. Example: if a 2012 patent application is issued in 2014, the issued patents will appear in 2012 in green.
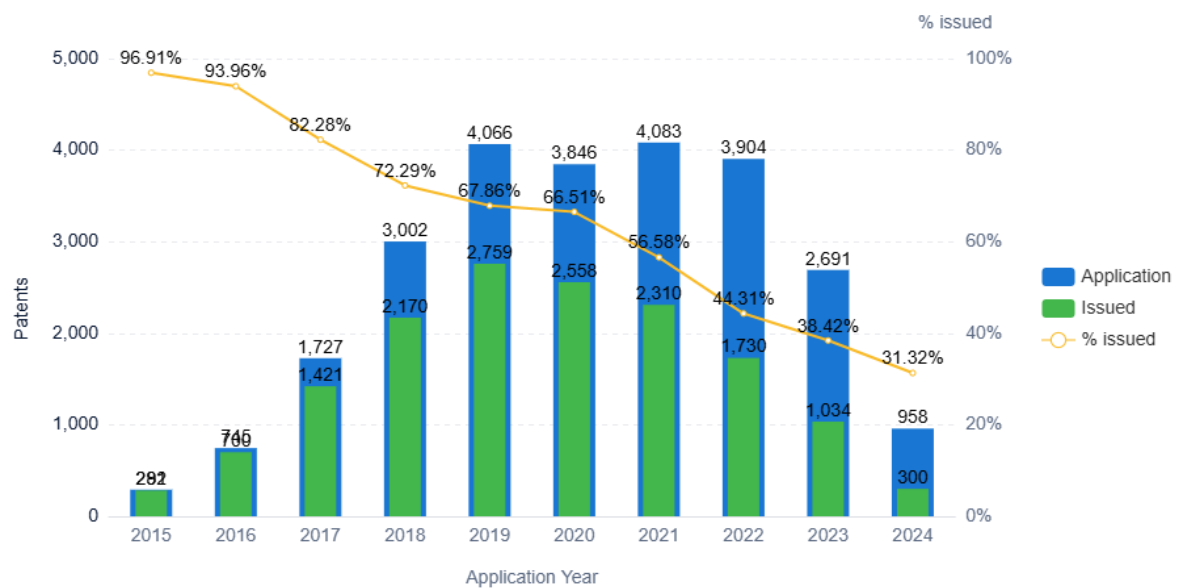
Simple Legal Status

Simple legal status breakdown of the technology field. This tells you the proportion of patents in the technology space that are in effect, or no longer active, which you can then use to filter by.

Undetermined : 2.06% (527)

Inactive : 18.39% (4,706)

Active : 57.38% (14.7K)

Pending : 22.17% (5,673)
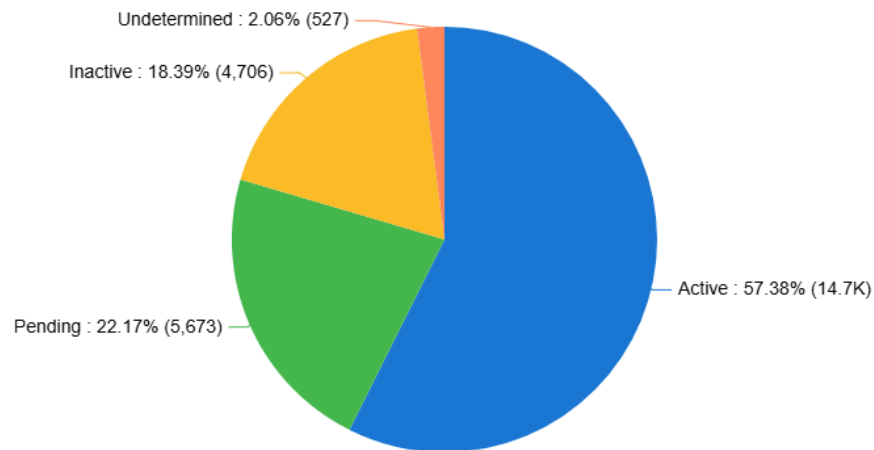
Patent Type

Patent type breakdown gives an indication of the focus of the organisations operating in this technology space, whether they are protecting the function (invention, utility models) or the appearance (designs) of their inventions.

Utility models : 3.48% (891)
Designs : 3.85% (986)
Invention : 92.66% (23.7K)
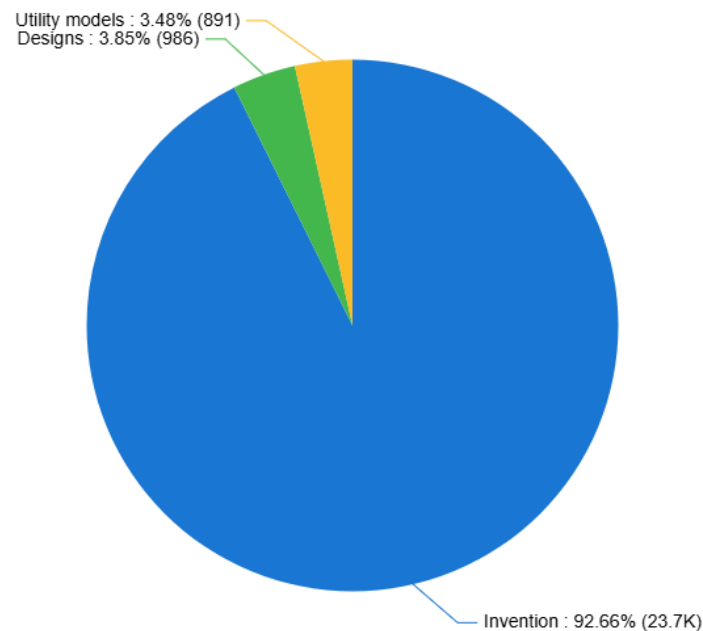
Technology Life Cycle

Analyze the change in number of applications and patent applicants over time to understand the life cycle of the technology space. This graph may indicate at what stage the technology is in as well as its history. Whether it is wise or suitable to invest, or if the technology is in a state of decline.
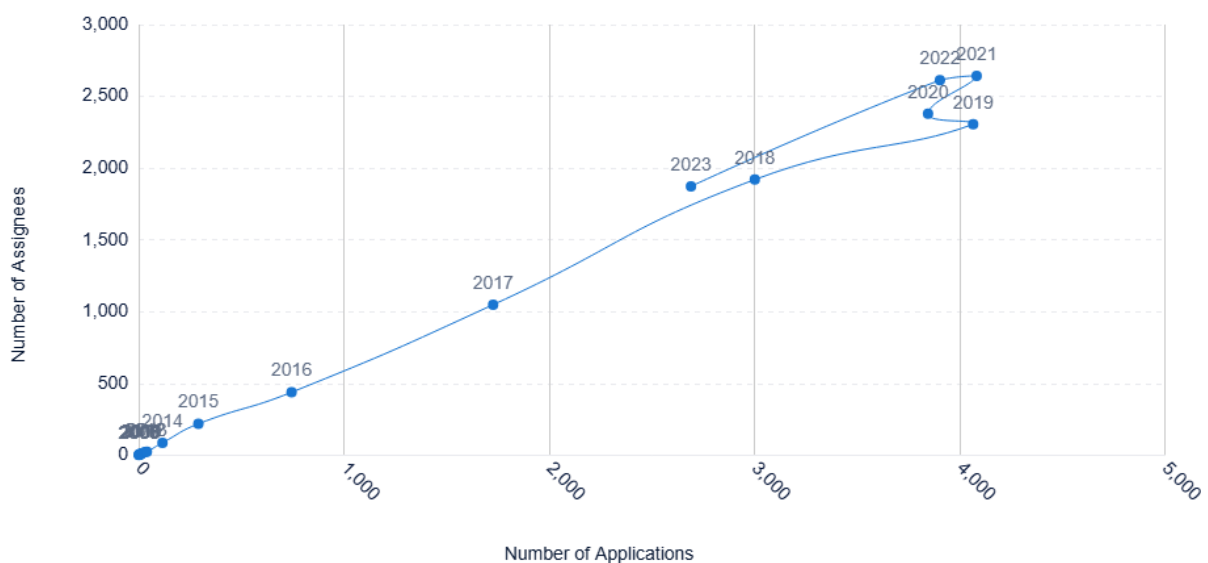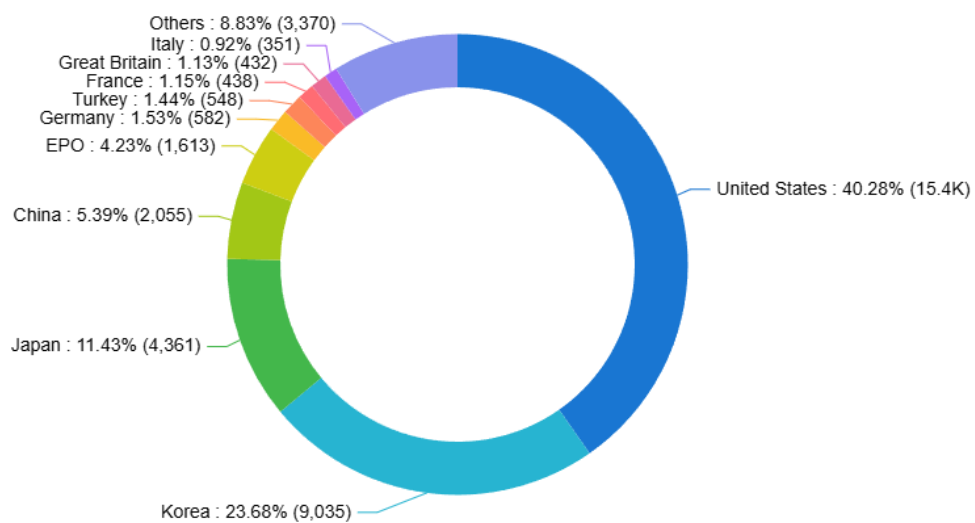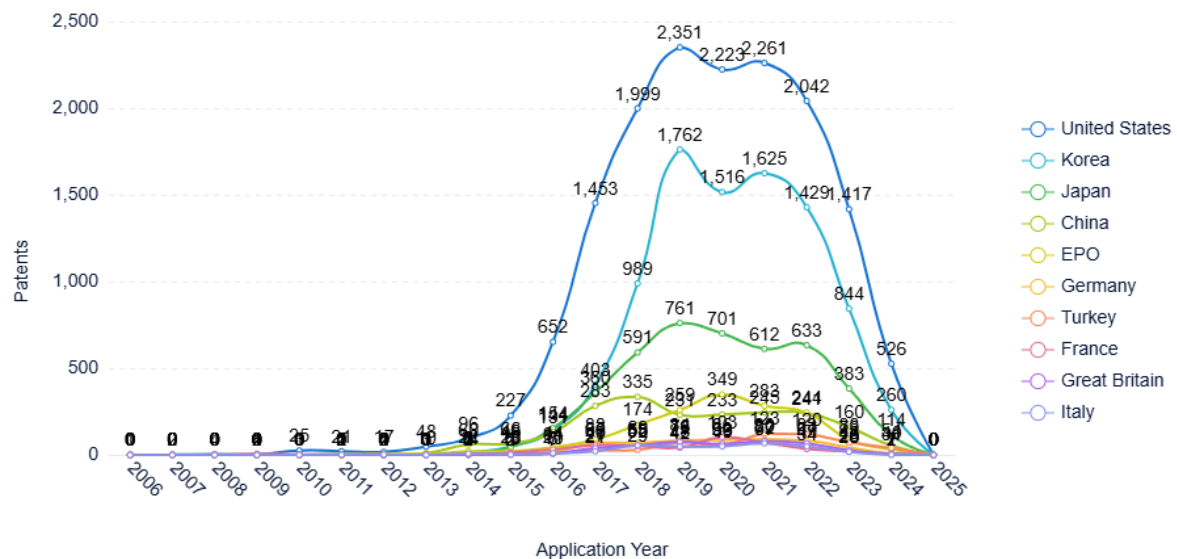
Geographic Territories

Top Countries of Origin

This shows the countries in which the earliest application was filed to show the geographic source of the technology. This helps users assess the innovation capability of a country and can either indicate where a majority of organisations are based, or which countries companies want to first capitalise in. (Jurisdiction is considered in the below analysis.)

The chart displays one document per application and is calculated using the latest publication.

Others : 8.83% (3,370)
Italy : 0.92% (351)
Great Britain : 1.13% (432)
France : 1.15% (438)
Turkey : 1.44% (548)
Germany : 1.53% (582)
EPO : 4.23% (1,613)
China : 5.39% (2,055)
Japan : 11.43% (4,361)
Korea : 23.68% (9,035)
United States : 40.28% (15.4K)

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Application Trend in Countries of Origin

Yearly trend of earliest applications in the technology field, within the top countries of origin. This shows the change in focus in different countries of origin for the searched technology space. It helps you understand whether the focus or country of origin of the technology has changed over time. (Jurisdiction is considered in the below analysis.)

The chart displays one document per application and is calculated using the latest publication.
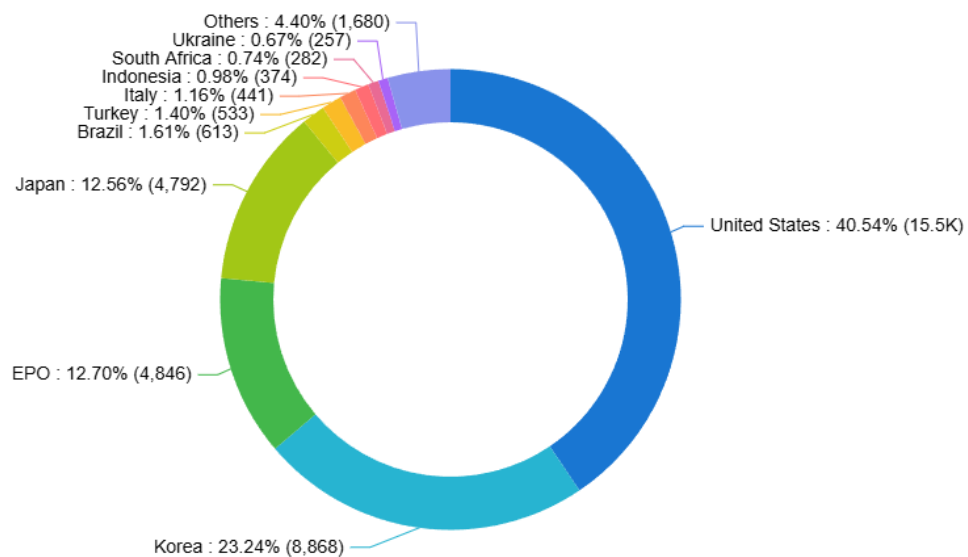
Top Countries

Shows the geographic coverage of where patent applications have been filed. This gives an indication of the targeted geographic markets the technology is most prominent and commercialized in. This is useful for companies to plan their filing strategy – ensuring their portfolio covers the top jurisdictions making them an attractive acquisition target. It may also help you identify untapped markets for this technology.(Jurisdiction is considered in the below analysis.)
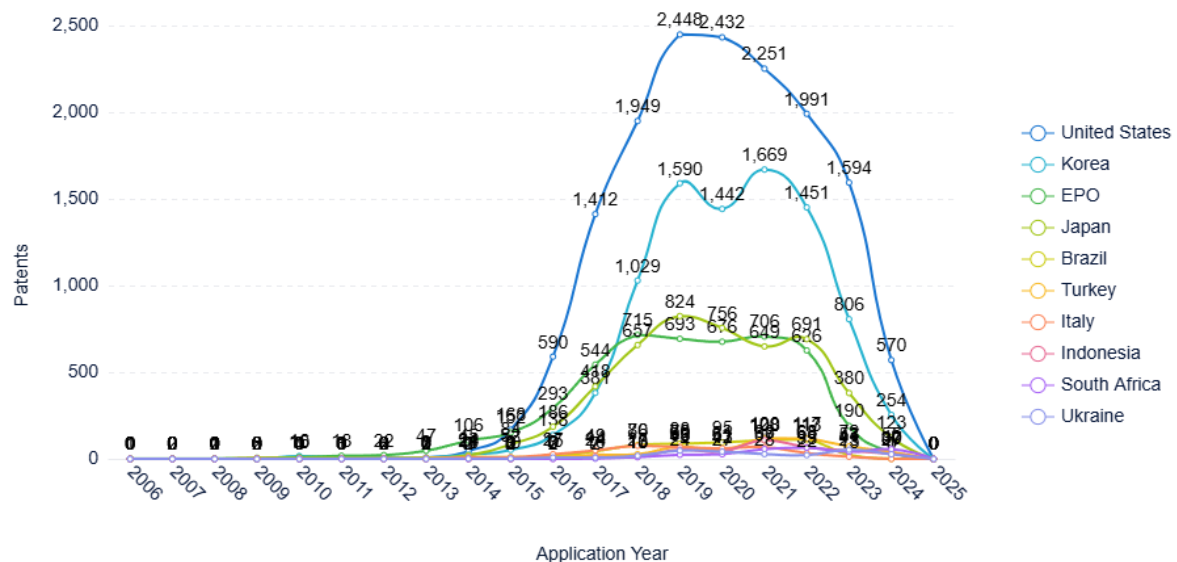
The chart displays one document per application and is calculated using the latest publication.

- Others : 4.40% (1,680)
- Ukraine : 0.67% (257)
- South Africa : 0.74% (282)
- Indonesia : 0.98% (374)
- Italy : 1.16% (441)
- Turkey : 1.40% (533)
- Brazil : 1.61% (613)
- Japan : 12.56% (4,792)
- EPO : 12.70% (4,846)
- Korea : 23.24% (8,868)
- United States : 40.54% (15.5K)

Application Trend in Top Countries

Yearly application trend of the Top Countries within the technology field. This gives an indication of the geographical markets targeted by the technology field and how direction changes over time, to help you identify patenting trends and shifts in markets. (Jurisdiction is considered in the below analysis.)
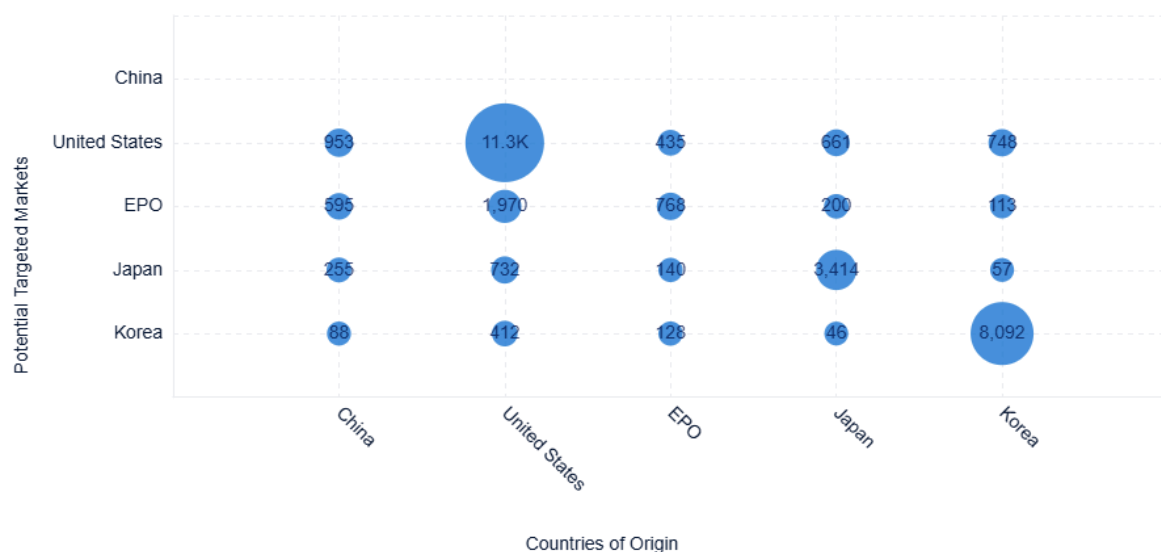
The chart displays one document per application and is calculated using the latest publication.
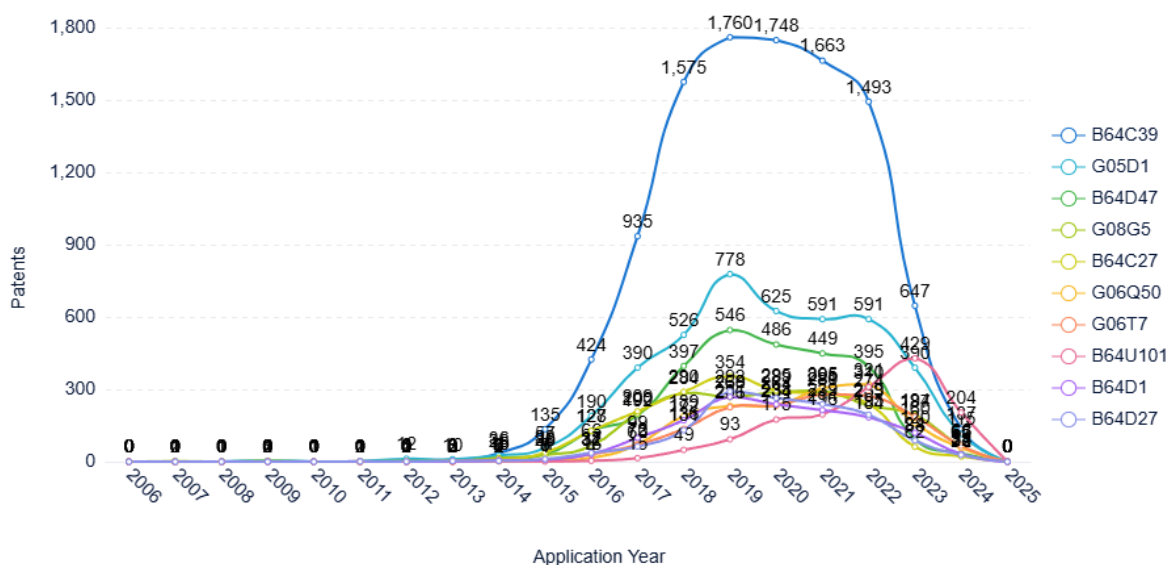

IP5 Territory Distribution

Analyse the origin and protection of the technology field in IP5 (EP, CN, JP, KR, US). This gives a picture of which country, out of the top 5 largest intellectual property offices, the technology field originates from and is more heavily protected in. This helps you to understand if organisations are typically protecting their invention in their own market or extending this to more profitable markets elsewhere.
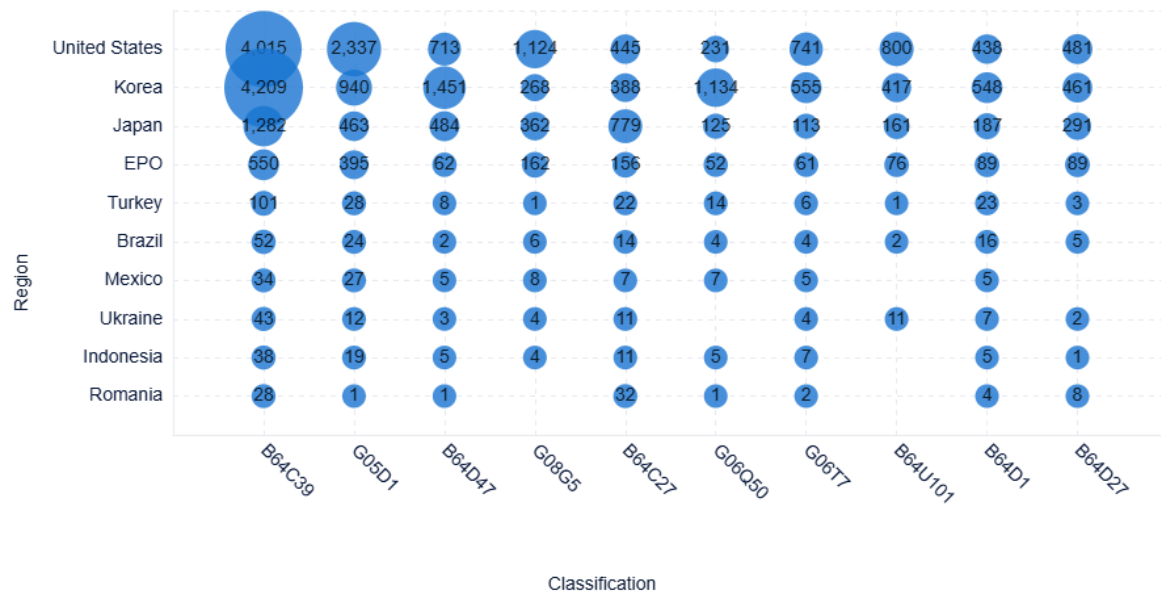
The chart displays one document per application and is calculated using the latest publication.

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Key Technologies

Key Technologies

Visualise the major technology areas to understand alternative applications of the technology and find potential opportunities for licensing and white space.

| B64C39
Aircraft not otherwise provided for [2023.01]
Patents: 10,573 | B64D47
Equipment not otherwise provided for [2006.01]
Patents: 2,768 | G08G5
Traffic control systems for aircraft [2025.01]
Patents: 1,948 | B64C27
Rotorcraft; Rotors peculiar th....
[2006.01]
Patents: 1,929 |

G06Q50
Information and communication technology [ICT] specially adapted for implementation of business pro...
Patents: 1,595

B64U101
UAVs specially adapted for particular uses or applications [2023.01]
Patents: 1,479

B64D1
Dropping, ejecting, releasing or receiving articles, liquids, or the like, in flight (weapon sights or...
Patents: 1,378

G05D1
Control of position, course, altitude or attitude of land, water, air or space vehicles, e.g. using automatic pilots (drive control...
adapted for autonomous road vehicles B60W60/00) [2024.01]
Patents: 4,311

G06T7
Image analysis [2017.01]
Patents: 1,519

B64D27
Arrangement or mounting of power plants in aircraft; Aircraft character...
Patents: 1,357

Application Trend of Key Technologies

Yearly application trend of the major technology areas. Understand how investment into different technologies has changed over time.

Geographic Distribution of Key Technologies

Understand the top targeted markets by analyzing the distribution of key technologies across the top 10 countries/regions. This can help you identify top markets for commercialisation and the commercial potential of different countries. (Jurisdiction is considered in the below analysis.)

Region	B64C39	G05D1	B64D47	G08G5	B64C27	G06Q50	G06T7	B64U101	B64D1	B64D27
United States	4,015	2,337	713	1,124	445	231	741	800	438	481
Korea	4,209	940	1,451	268	388	1,134	555	417	548	461
Japan	1,282	463	484	362	779	125	113	161	187	291
EPO	550	395	62	162	156	52	61	76	89	89
Turkey	101	28	8	1	22	14	6	1	23	3
Brazil	52	24	2	6	14	4	4	2	16	5
Mexico	34	27	5	8	7	7	5		5	
Ukraine	43	12	3	4	11		4	11	7	2
Indonesia	38	19	5	4	11	5	7		5	1
Romania	28	1	1		32	1	2		4	8

Classification

Assignee Analysis

Assignee Overview

Top applicant financials.

Financial information is from the last full year's data e.g. Jan 2024 - Dec 2024.

	SZ DJI TECH CO LTD	LG ELECTRONICS INC	QUALCOMM INC	THE BOEING CO	AMAZON TECH INC	AUTEL ROBOTICS CO LTD	INTERNATIONAL BUSINESS MACHINE CORPORATION	WALMART APOLLO LLC	WING AVIATION LLC	ELECTRONICS & TELECOMM RES INST
Annual Sales	-	$57,749,555,867	$35,820,000,000	$77,794,000,000	-	-	$61,860,000,000	-	-	-
Employee Number	10,001	35,111	50,000	171,000	-	-	305,300	2,200,000	251	51
Market Cap	-	$12,568,180,857	$119,956,000,000	$158,876,000,000	-	-	$149,650,000,000	-	-	-
R&D Expense	-	$2,605,767,087	$8,818,000,000	$3,377,000,000	-	-	$6,343,000,000	-	-	-
R&D Expense %	-	4.51%	24.62%	4.34%	-	-	10.25%	-	-	-
Total Assets	-	$41,303,233,451	$51,040,000,000	$137,012,000,000	-	-	$135,241,000,000	-	-	-
Intangible Assets	-	$1,966,188,354	$12,050,000,000	$10,187,000,000	-	-	$71,216,000,000	-	-	-
Operating Income	-	$2,433,371,552	$8,650,000,000	$-813,000,000	-	-	$10,503,000,000	-	-	-
Acquisition of business	-	-	$-235,000,000	$-70,000,000	-	-	$-5,082,000,000	-	-	-
Capital Expenditure	-	$-2,836,891,426	$-1,450,000,000	$-1,527,000,000	-	-	$-1,810,000,000	-	-	-

	SZ DJI TECH CO L TD	LG EL ECTR ONICS INC	QUAL COM M INC	THE BOEI NG C O	AMA ZON TECH INC	AUTEL ROBO TICS C O LTD	INTERNATIO NAL BUSINES S MACHINE C ORPORATION	WALM ART A POLLO LLC	WING AVIAT ION L LC	ELECTRO NICS & TE LECOMM RES INST
Net In come	-	$488, 143,7 65	$7,33 9,00 0,000	$-2,2 22,00 0,000	-	-	$7,514,000,0 00	-	-	-
Total Debt	-	$9,95 1,201, 571	$16,0 67,00 0,000	$54,1 21,00 0,000	-	-	$59,935,000, 000	-	-	-
Intern ational Sales	-	$34,2 21,79 8,847	$34,5 61,00 0,000	$32,4 14,00 0,000	-	-	$36,551,000, 000	-	-	-
Gross I ncome	-	$13,8 96,05 7,533	$19,9 51,00 0,000	$7,70 8,00 0,000	-	-	$33,498,000, 000	-	-	-

Top Assignees

The top companies with the largest patent portfolios in the technology field. Understand who are the largest players and the competitive threats in the technology space.
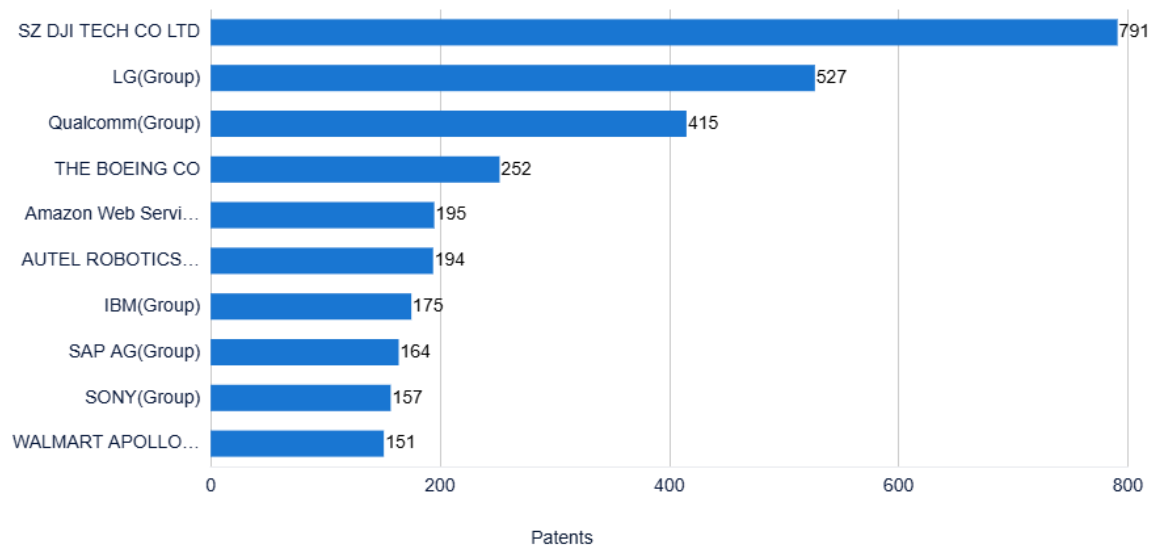
Assignee Concentration

Analyze the market share the top companies in the technology field possess, helping to assess the level of competition and any monopolization in the technology field over a period of time.

Definition of market share: The ratio of the number of applications of the top 10 assignees to the total number of applications. (Where there are joint assignees, the application will be considered multiple times).
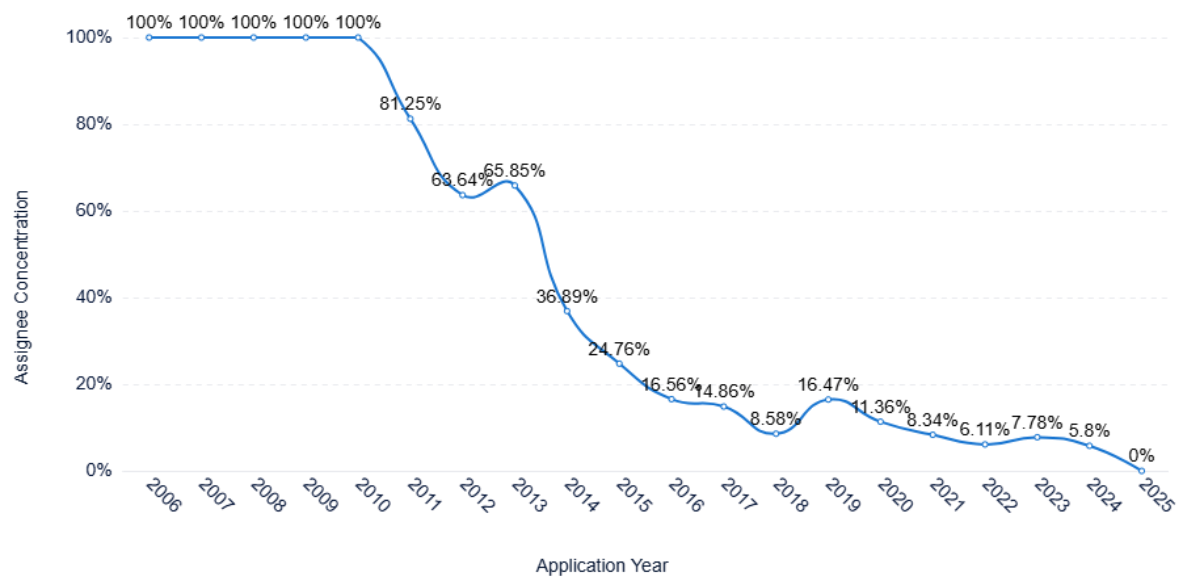
New Entrants

Identify new and emerging entrants in the technology field. These entrants indicate new competition. Alternatively, they can be considered as potential acquisition or partnership opportunities.

New entrant definition: Applicants who have filed applications only in the past 5 years.

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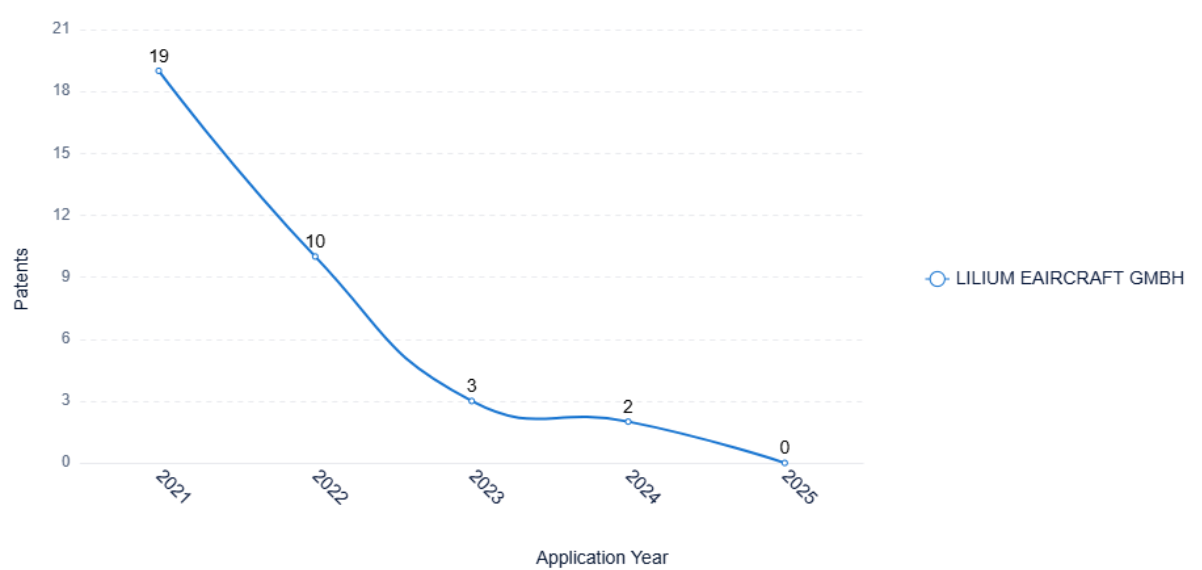
Assignee Relationships

Analyze relationships between assignees involved in the development of an invention. This is useful to understand which assignees are more open to forming partnerships and where licensing opportunities may exist.

The chart is calculated using Applicants (Original Standardized Assignee). Applicant names cannot be edited or merged.
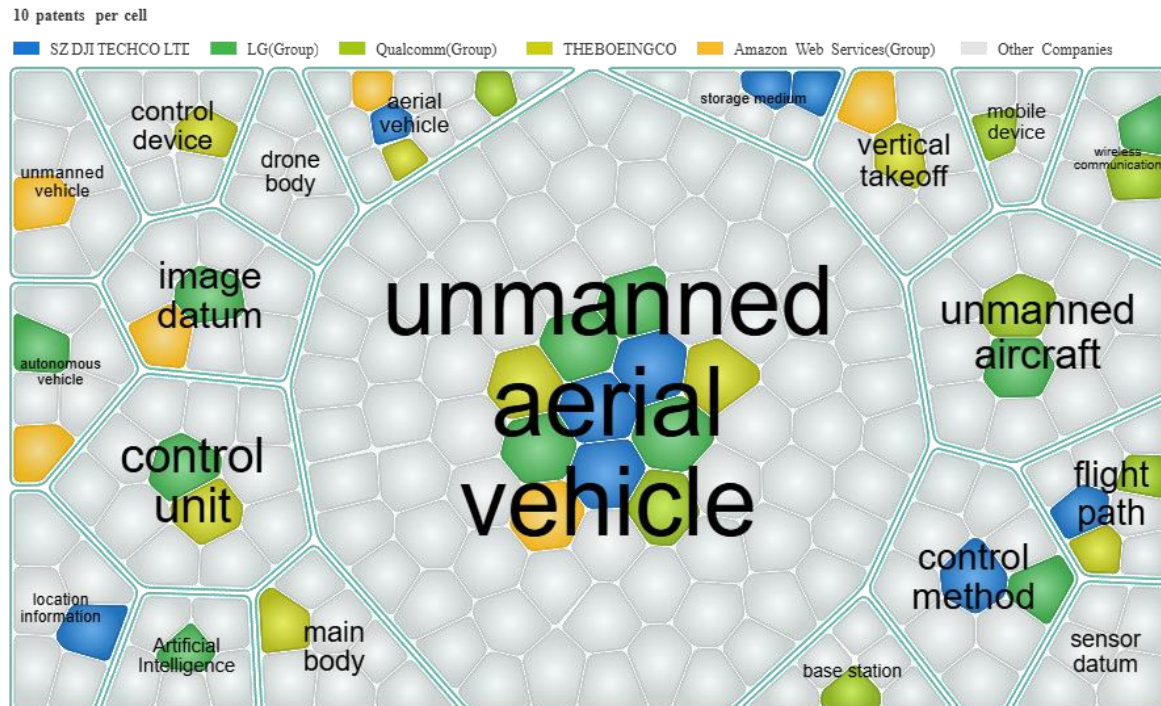
Technology focus of Top Assignees

Analyze the technology focus of the top assignees. Visualise the presence of organisations in different technology classifications, as well as the variance of technology in their portfolio. It helps you understand current investment in various technology fields, which allows you to identify licensing opportunities and partnerships.

Application Trend of Top Assignees

Yearly application trend of top assignees show the change in patenting activity and investment by the top companies in the technology space over a period of time.

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Geographic Distribution of Top Assignees

This chart shows the geographic distribution of top assignees. This helps you to understand if companies are competing in similar geographies or if their targeted markets are different. (Jurisdiction is considered in the below analysis.)
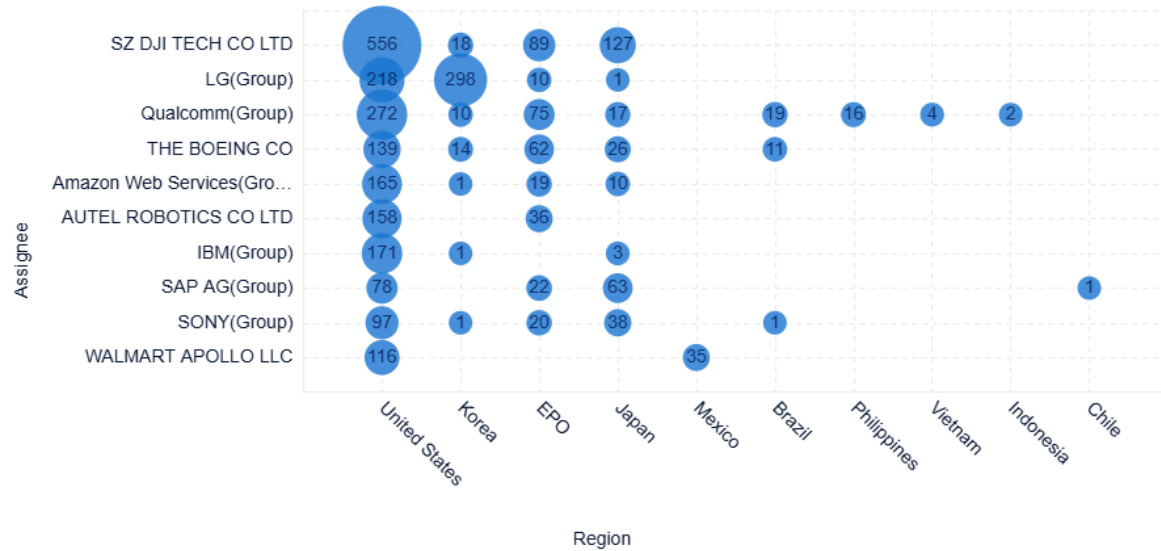
Cell Diagram

The cell diagram shows the keywords and phrases of the records owned by the top current assignees in the technology field. This is helpful for providing a deeper understanding of the concepts within the defined technology and the assignees that are working on those concepts. It helps you differentiate the technological focus of each of the top current assignees.

Keywords are calculated using the latest 5,000 patents. The relative coverage is represented by the number of cells under each assignees, with each cell representing the same number of patents.

10 patents per cell

SZ DJI TECHCO LTD · LG(Group) · Qualcomm(Group) · THE BOEING CO · Amazon Web Services(Group) · Other Companies

Inventor Analysis

Top Inventors

The graph shows the top inventors in the technology field. This information is useful for evaluating the work of top performers in a specific technology field or for recruiting inventors.

Application Trend of Inventors

Yearly application trend of top inventors can help you identify inventors with the highest patenting activity in the most recent years. This identifies emerging or existing talent in the technology field, and you may also identify the inventing cadence of certain inventors.

Analyze inventor partnerships

Assess the relationships between top inventors to identify teams who work together in the technology space. This may represent talent groups for recruiting or collaboration opportunities.
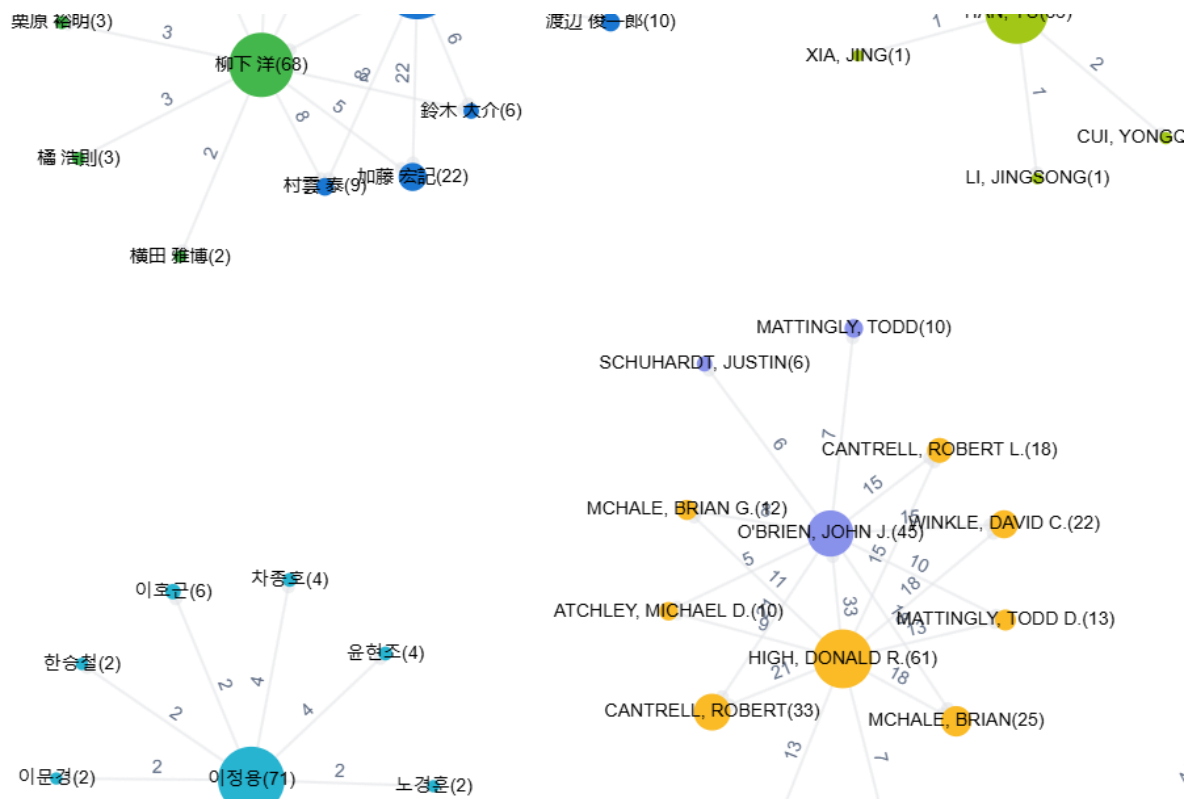
Key Patents

Most Cited Patents

View the top 10 records that have been cited most frequently by other records to understand which records are more prolific and have had their technology built upon by others. These patents are likely to be more influential and may represent the core, innovative technology of the organization it represents.

Patent	Cited by Count
US20200294401A1	428
US20200389469A1	380
US20210073692A1	145
US10782681B1	103
US20190204425A1	100
US11235890B1	98
US10613209B2	98
US10336543B1	94
US10907940B1	90
US10991242B2	82

Cited by Count
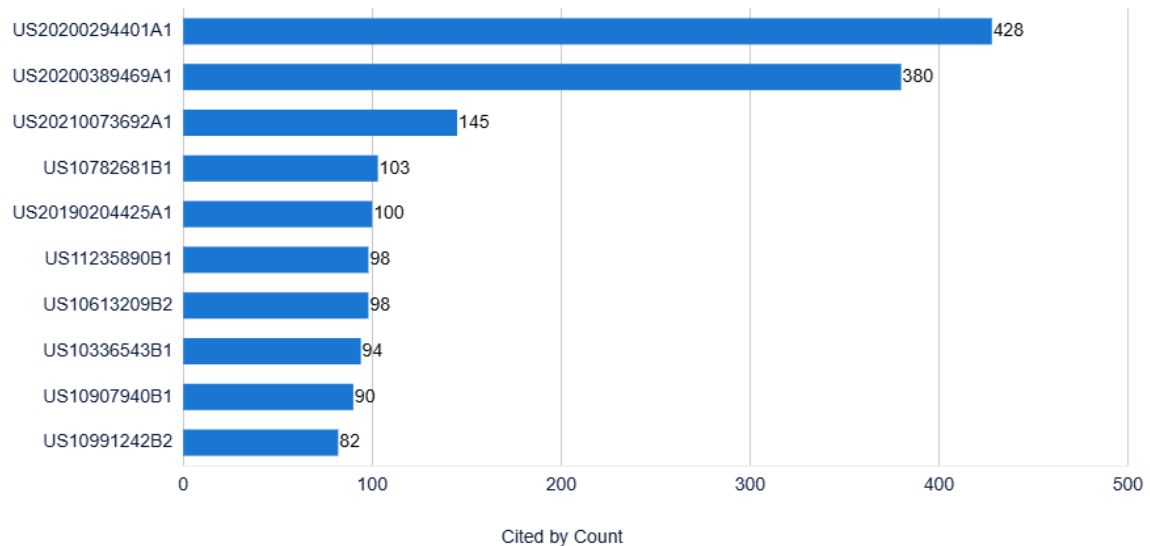
Largest Invention Families

Determine which patent family has the furthest reach of either global coverage, divisional counterparts, or continuations. Identify the most successful inventions that have received a large amount of resources for increased level of coverage (either by expanding the technological coverage or geographical reach).

Note: This chart will display one representative per PatSnap family, if your technology key report results display setting is on ungrouped or one document per application. This is to remove document duplicates.

The latest publication will always be selected as the representative, regardless of the result display setting you have on.
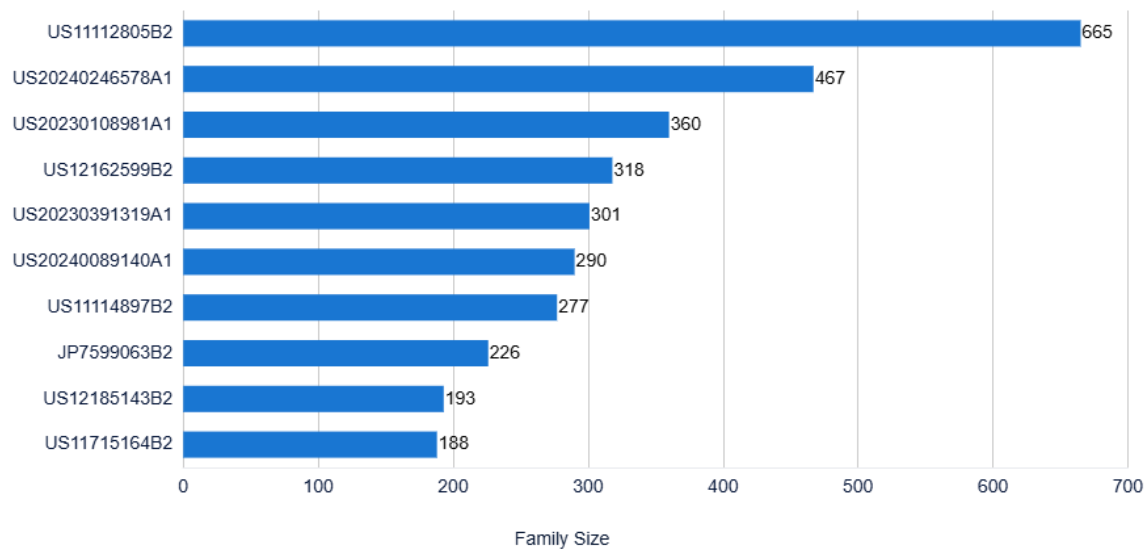
Most Claim-Heavy Patents

Identify the patents that hold the largest number of claims (Independent and Dependent). These records represent more complex inventions and those that have the highest level of financial and time investment involved in filing and prosecution.

The chart displays one document per application and is calculated using the granted patent.

No. of Claims
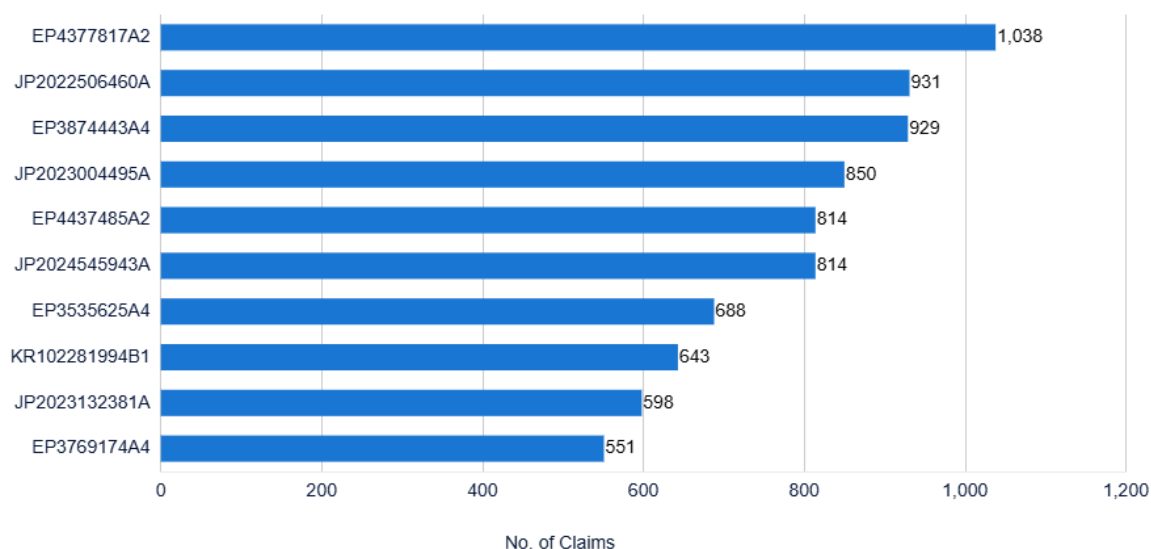
Most Litigated Patents

Identify the patents involved in the most number of litigation cases. This indicates litigation risk associated to patenting in a similar technology space.

The chart displays one document per application and is calculated using the granted patent.

Cases
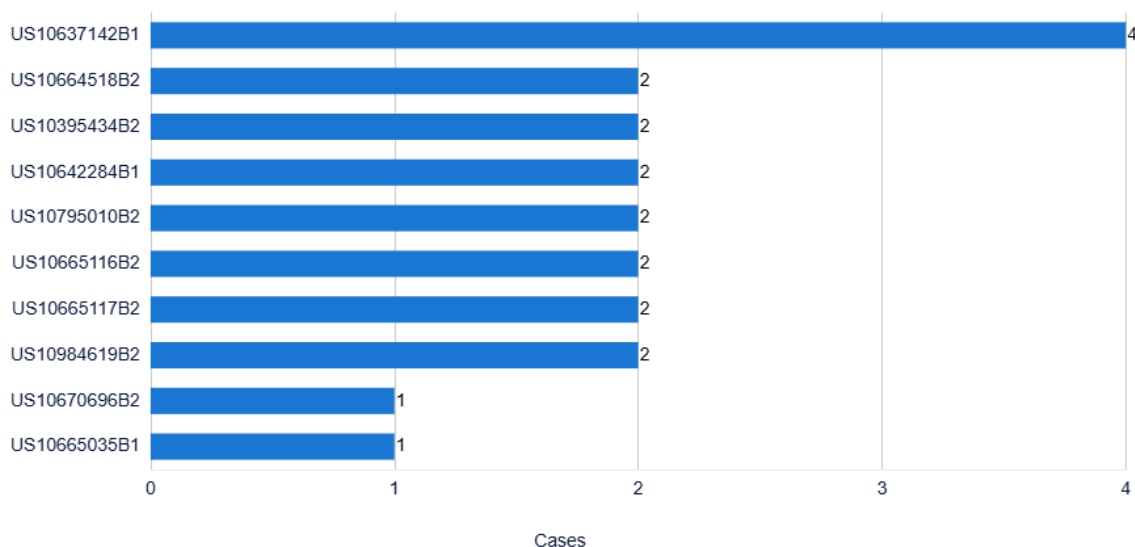
Market Valued Patents

Value Overview

Understand the value of patents across the technology space.

The chart displays one representative per simple family. Patent value is applied at the simple family level.

Total Value	Simple Family Numbers
4,746,696,600 (USD)	21,095 (Group)

Portfolio Value Distribution

Assess the lucrativeness of a technology space based on the spread of estimated patent valuation, with lucrative technologies having a greater proportion of their patent simple families in the higher value buckets.

The chart displays one representative per simple family. Patent value is applied at the simple family level.
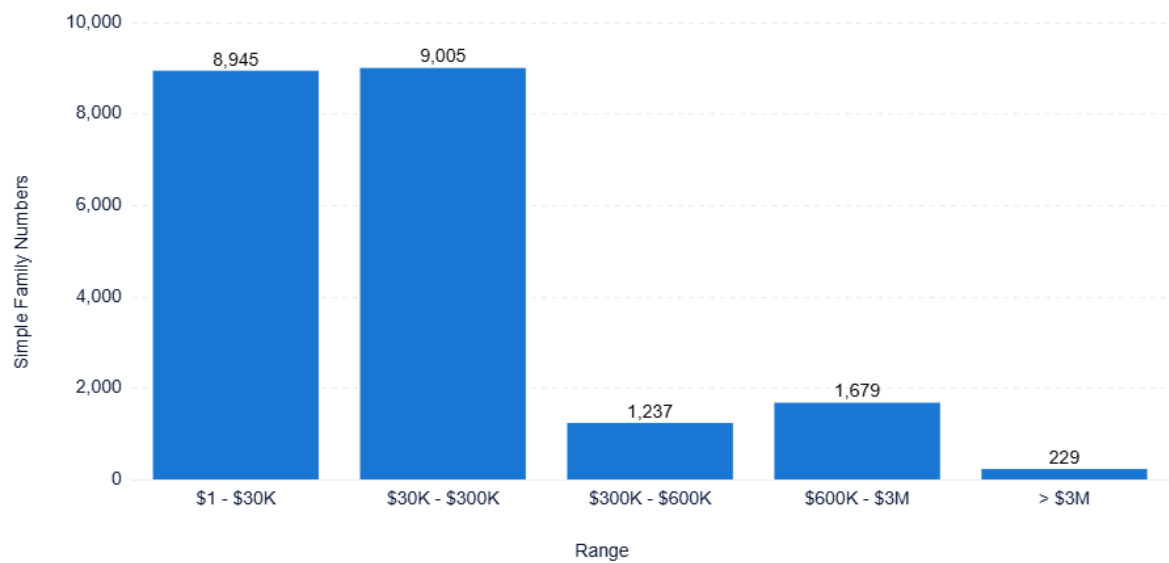
Technology Area Benchmark

Compare the searched technology's estimated patent value within each IPC class with the average estimated patent values across all assignees within each IPC class. This is helpful to assess the relative strength of innovation that a technology field holds, in comparison to the average valuations of the IPCs covered.

The chart displays one representative per simple family. Patent value is applied at the simple family level.
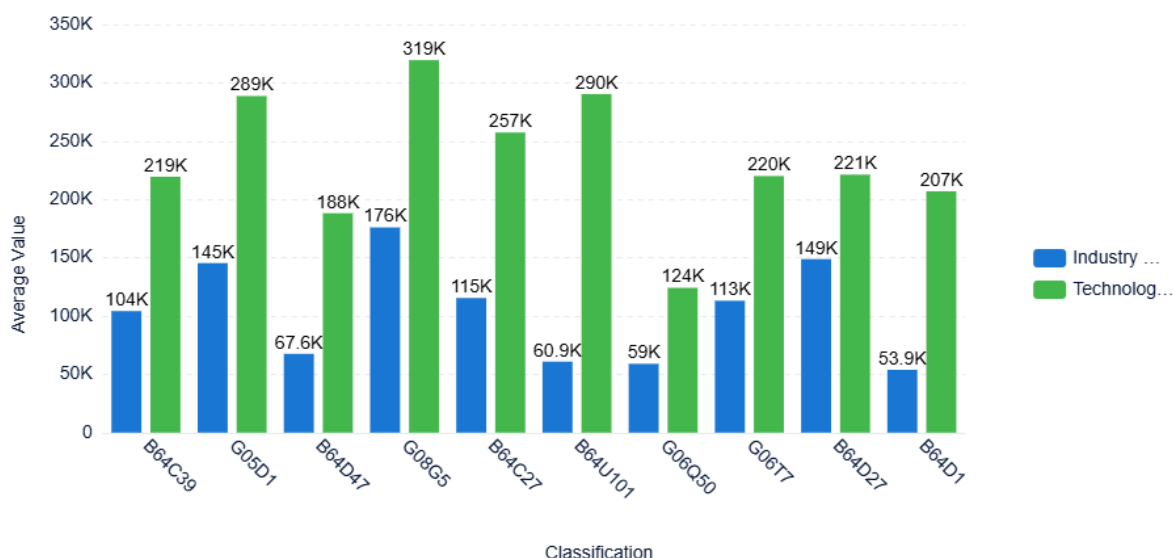
Highest Market-Valued Patents

Identify the intellectual property gems within a technology field and discover which inventions have the highest market-valuation and lucrative potential.

The Highest Market-Valued Patents are the patent simple families in the technology field with the highest estimated patent values.

The chart displays one representative per simple family. Patent value is applied at the simple family level.

| Patents	Title	Std. Current Assignee	Simple Family	IPC Scope	Value(USD)	Priority	Application	Expiry Year	Status
US12132609B2	Blockchains for securing IoT devices	INTEL CORP	46	11	$12,800,000	2016/12/30	2022/03/23	2038	Active
US11920934B2	Path planning using sparse volumetric data	MOVIDIUS LTD	34	10	$12,320,000	2016/08/19	2021/06/14	2037	Active

Patents	Title	Std. Current Assignee	Simple Family	IPC Scope	Value(USD)	Priority	Application	Expiry Year	Status
JP6809584B2	電波測定システム	MITSUBISHI ELECTRIC CORP	30	2	$11,120,000	2018/04/03	2019/10/07	2038	Active
EP3448753B1	Unmanned aerial vehicle pick-up and delivery systems	UNITED PARCEL SERVICE OF AMERICAN INC	38	2	$10,610,000	2016/04/29	2017/04/28	2037	Active
JP2024053036A	膨張したポリマーペレット	ADIDAS AG	32	1	$9,990,000	2014/08/26	2024/03/07	Expiry data unavailable	Pending
MY206517A	Access control for network slices of a wireless communication system	KONINKLIJKE PHILIPS NV	30	2	$9,390,000	2017/01/04	2018/01/03	2038	Active
JP2024038405A	無線ネットワークのための動的送信制御	AEROVIRONMENT INC	51	4	$9,360,000	2010/09/09	2024/01/17	Expiry data unavailable	Pending
US12139274B2	Systems and devices for remotely operated unmanned aerial vehicle report-suppressing launcher with portable RF transparent launch tube	AEROVIRONMENT INC	41	9	$9,210,000	2009/09/09	2023/06/15	2030	Active
MX412305B	APARATO PARA EL CONTROL DE MALEZAS	DISCOVERY PURCHASER CORP	57	9	$9,160,000	2017/08/22	2019/12/18	2038	Active
US12103678B2	Elevon control system	AEROVIRONMENT INC	37	12	$9,000,000	2009/09/09	2023/04/25	2030	Active

Licensing Deals

Annual In-Licensing and Out-Licensing

A graph to show the licensing activity of the technology space over time. Evaluate the characteristics of previously licensed patents and assess the likelihood of licensing your patent in the technology space.

The chart displays one document per application and is calculated using the granted patent.

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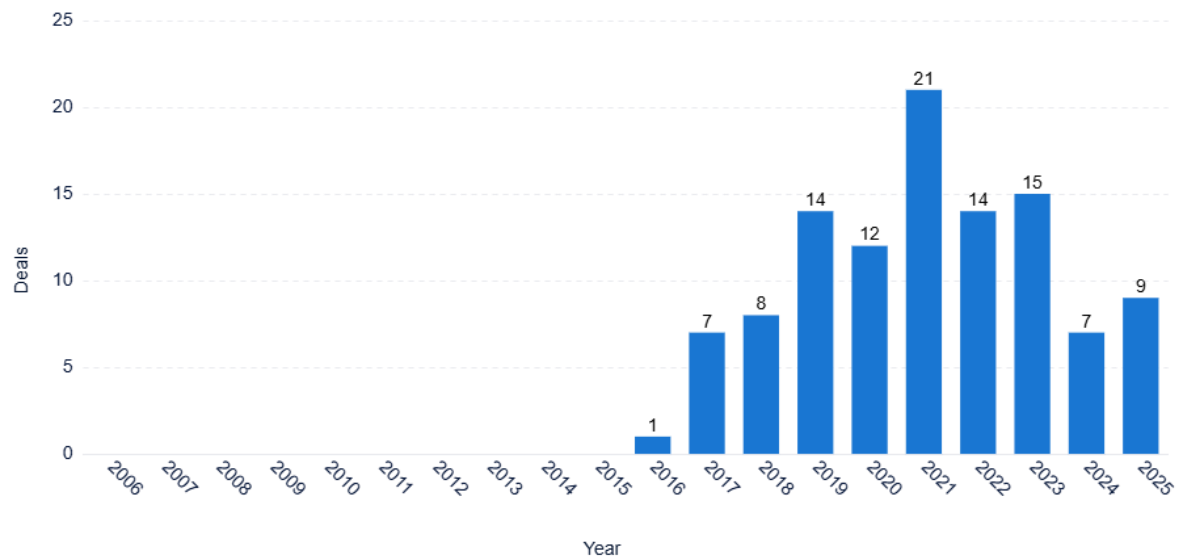
Patent Litigation

Litigation Overview

Overview of the litigation information related to the technology space.

The chart displays one document per application and is calculated using the granted patent (excludes CN/JP administrative cases).

Total Cases	Ave. Duration	Patents Involved	Plaintiff	Defendants
21	1.2 yrs	30	13	16

Litigated Concepts

Understand the keywords and concepts associated with patents involved in litigation. This is useful to understand which technology areas are most frequently involved with lawsuits and highlights the litigation risk of holding patents in certain technology fields.

The size of the segment corresponds to the number of cases associated to the keyword or concept (max. 5,000 patents used).

The chart displays one document per application and is calculated using the granted patent.

Basis of Termination

Read the case details to understand more about how cases have been resolved in the technology field.

A chart to show the breakdown of basis of termination (US and GB data).

The chart displays one document per application and is calculated using the granted patent.

Stayed : 9.52% (2)

Voluntary dismissal : 9.52% (2)

Case Dismissed : 14.29% (3)

Undisclosed : 66.67% (14)
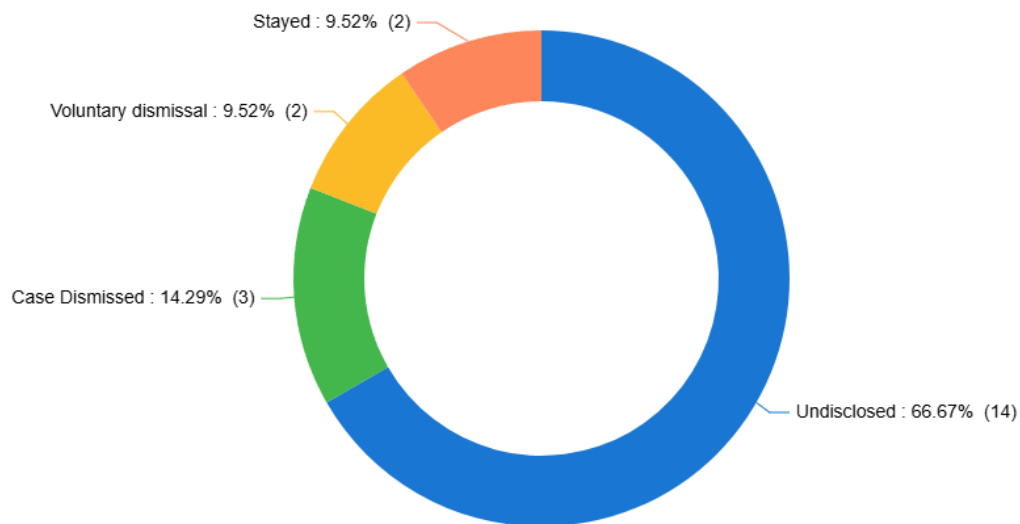
Litigation Timeline

Determine the frequency of litigation associated to the technology space. Understand the level of risk associated with entering or operating in this technology, and whether litigation is increasing or decreasing.

The chart displays one document per application and is calculated using the granted patent(US, CN, TW, JP, ES data).
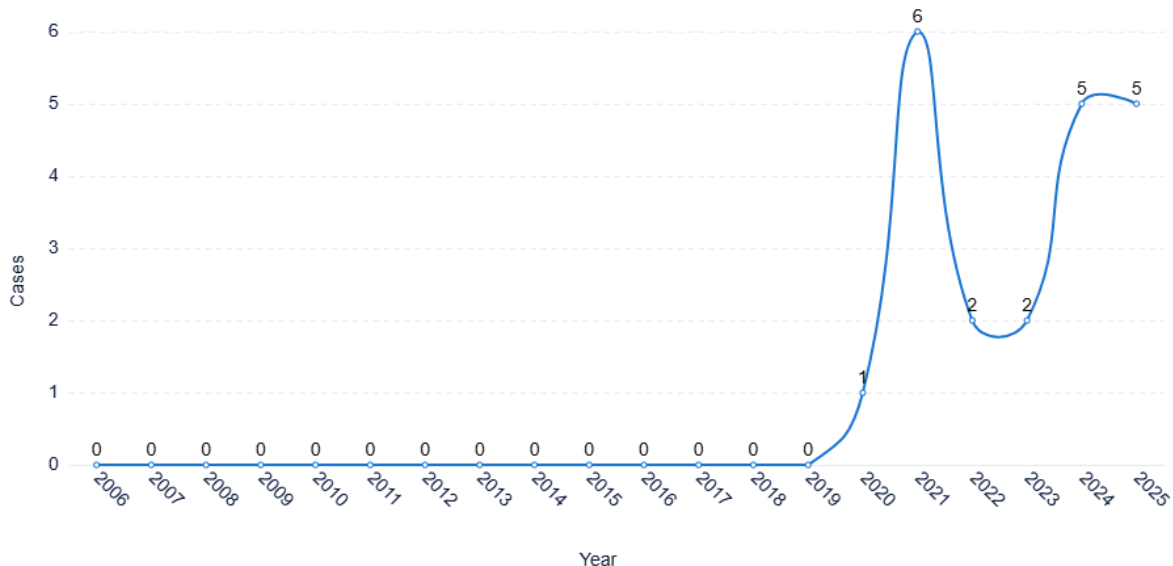
Most Assertive Plaintiffs

Identify the top 10 most litigious organizations in the technology space. These organizations may pose a greater litigation threat to nearby players.

The chart displays one document per application and is calculated using the granted patent.
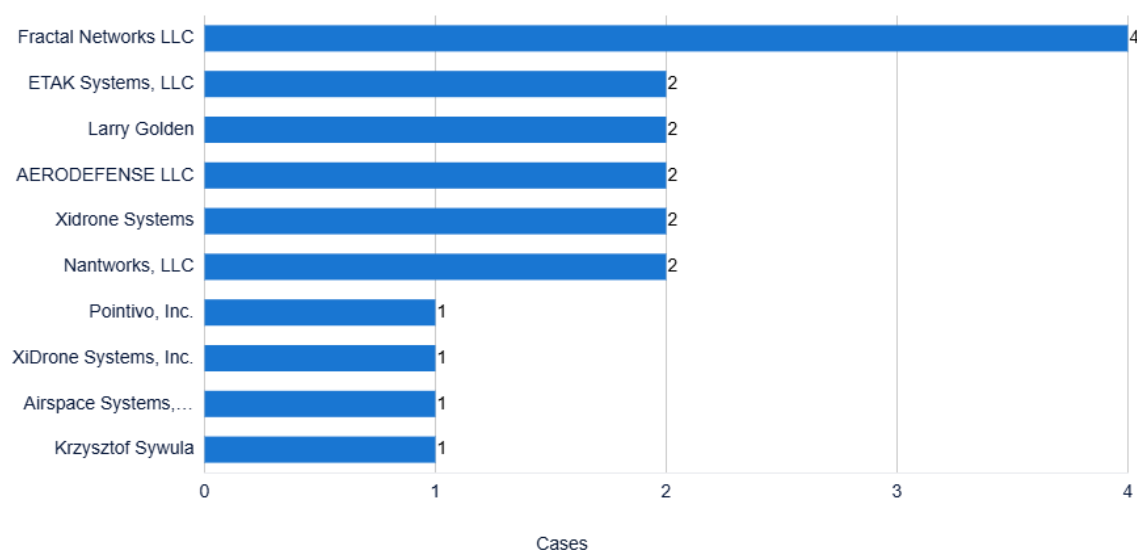
Longest Litigated Cases

Identify the lengthiest litigation cases. A long litigation case can be very expensive as it can involve a lot of preparation, unpredictable appeal outcomes, and outsourced legal advice. Patents involved in long litigation cases may protect technology that is valuable to the company that owns it as they are willing to invest much time and money to fight for the rights.

The chart displays one document per application and is calculated using the granted patent(US, CN, TW, JP, ES data).

Case	Duration (Year)
3:20-cv-06262	3.5
0:22-cv-02749	1.5
3:21-cv-02669	1.5
1:23-cv-00055	1.5
3:22-cv-05246	1.5
3:21-cv-01450	1.5
1:21-cv-01149	0.5
23-740	0.5
3:21-cv-02683	0.5
1:21-cv-01532	0.5

Duration of Litigation Case (Year)
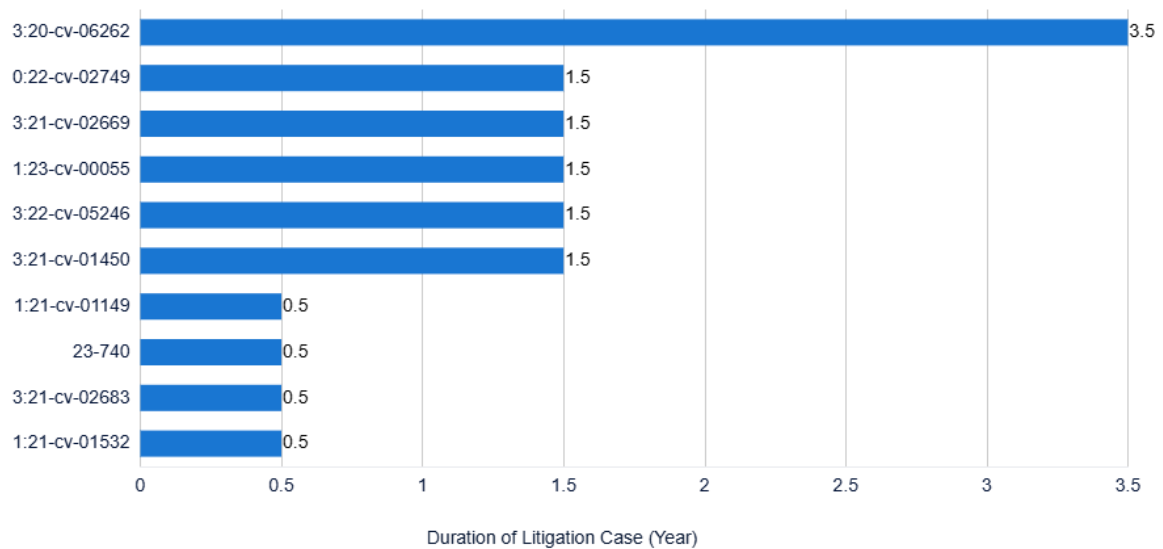
Innovation Word Clouds

Innovation Word Cloud

A snapshot view of the keywords and phrases found within records in the technology space. This can be used to influence subsequent patent searches by making you aware of the more common terms used in this technology space.

The Word Cloud displays the most frequently occurring keywords of the most recent 5,000 publications in the technology field.
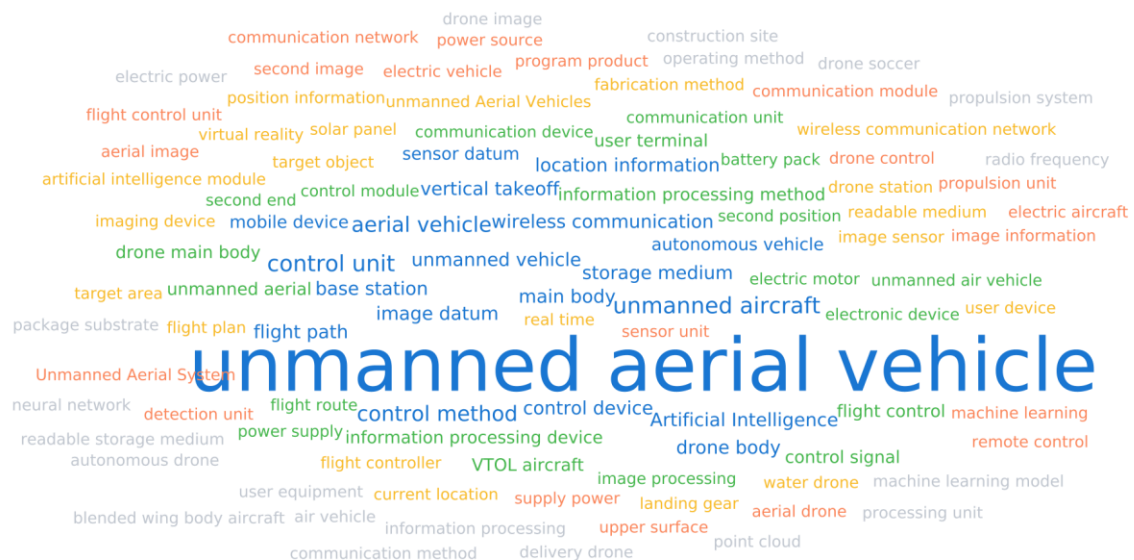
Wheel of Innovation

A two-tiered view of the keywords and phrases found within records in the technology space. This can be used to influence subsequent patent searches by making you aware of the more common terms used in this technology space. It is also useful to identify terms that are commonly associated with other similar terms.

The Circle Chart categorizes the most frequently occurring keywords of the most recent 5,000 publications in the technology field into a 2-tier hierarchy.

Technology Landscaping

Technology Landscaping

The Technology Landscape enables you to visualise the layout of the technology space, with peaks representing more concentrated areas of patenting activity and troughs representing areas of little or no activity - these suggest areas of potential opportunity and exploration.

The Landscape is generated through text clustering, followed by extracting of keywords by analysis of record text in each cluster.