



# How to carry out an effective Freedom To Operate search?

Tips & Tricks


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Questel – October 21, 2021

## Agenda

# Webinar Agenda “How to carry out an effective Freedom To Operate search”

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- A decorative graphic in the bottom-left corner featuring a complex, interlocking geometric pattern of various polygons in shades of gray, resembling a crystalline or architectural structure.
- Overview (Goals & purpose)
  - Strategy Formulation
  - Review your search results
  - Develop your search strategy
  - End Product & Legal information
  - Conclusions

01

## Overview

Goals & purpose

## Freedom To Operate

A Freedom To Operate (FTO) analysis begins by searching patent literature for issued or pending patents, and obtaining a legal opinion as to whether a product, process or service may be considered to infringe any patent(s) owned by others.

*(WIPO Magazine, "IP and Business: Launching a New Product: freedom to operate", September 2005)*

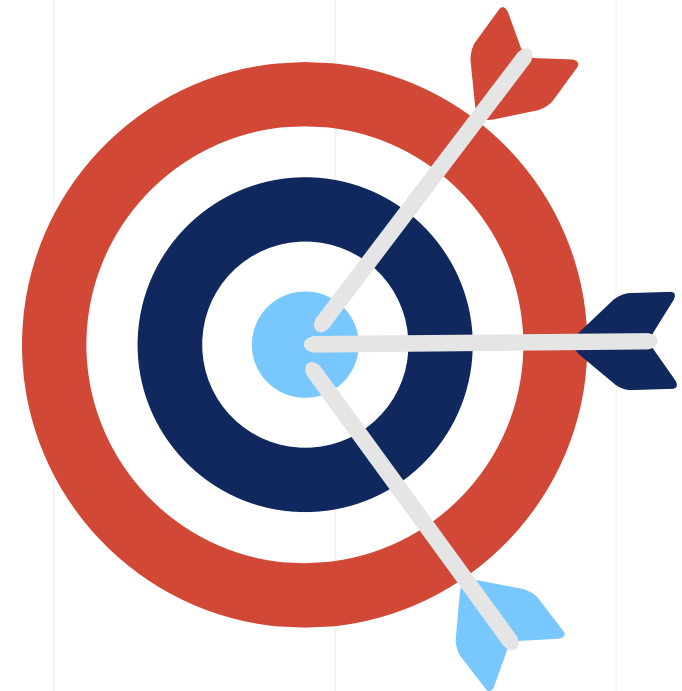


## Overview

Search parameters depend upon the proper scope

Useful to have:

- Keywords or specialized terms
- Class codes
- Similar patents
- Similar inventions
- Similar products
- Known inventors/assignees
- Known non-patent literature



## Considerations for a FTO Search

- Conduct a broad search, taking advantage of enhanced features
- Consider searching by country-level for clearance in a particular country
- Narrow search by patents that are still alive
- Narrow search by claims when you retrieve relevant patents and need to focus on what is claimed

### A two-step process

1. A general search to find the most patents in the subject area
2. A narrow search on claims within a particular country where the inventor is to be practiced or to focus on specifics that will be useful to the person doing the analysis

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## Strategy Formulation

## Considerations for an effective search

- Keywords
- Classification codes
- Semantics
- Citations (also look at citations of citations)
- Look for other keywords that were not used
- Consider additional classification schemes
- Consider inventors or assignees as potential search terms



Search capabilities – Typical Search

Preferred database: **FullPat** (see [here](#) how to activate this database)

- Better to focus on individual countries
- Native language when possible

Limitation:

- **Legal status:** Only alive patents can block you
  - Advice: choose “**Alive**” (but be careful with lapsed publications)
- **Validity date of the patents:** if the patent is lapsed/dead/expired, you are typically free to operate
  - Advice: choose “**Priority date**” and search “**21 years ago to present**”
- **Specific geographic areas: where you are trying to determine FTO**
  - Advice: consider searching by country level for clearance in a particular country
- **Field:** claims characterize and limit the scope
  - Advice: choose “**Claims**”



Search capabilities – Typical Search

Field Limitation:  
Claims

Patent validity limitation:  
Preceding 21 years

Legal State and geographic  
limitation:  
Alive and a specific country

Search by publication:  
FullPat database

Advanced search

Keywords

Claims ☐ Title ☐ Abstract ☒ Claims ☐ Description ☐ Object of invention ☐ Advantages over prior art drawbacks ☐ Independent Claims ☐ Concepts ☐ Full Text

Date: Priority From 2000-10-21

Patents published in (patent authorities): E.g.: US, EP

Legal status

Status: Alive No restriction in selected countries: US, EP

Legal events: None

Expiration date: No Restriction

Litigations & oppositions

More fields

FamPat family number

Collections

Search in: ☐ world patents (full text & biblio) grouped by invention-based families (FamPat) ☒ world patents (full text & biblio) displayed by individual country (FullPat) ☐ 63 authorities (full text only) displayed by individual country (Full Text)

Limit to recent publication: Search all publications

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This sample search is meant to illustrate suggested considerations for conducting a search for a freedom to operate decision and not the actual decision itself.

In order to determine if an invention is cleared, a comprehensive search must be conducted and then the results must be examined in great depth. Thus, the search should be as comprehensive as possible in order to insure a suitable decision.



#### Strategy Formulation

Formulate a search strategy to find patents involving the interaction between self-driving cars and emergency vehicles. Find relevant patents and send the results to the requester for analysis.

Make the results thorough, but easy for the requester to conduct the research.

Strategy Formulation

Autonomous vehicle(s)

Autonomously driven vehicle(s)

Self-Driving car(s)

Emergency vehicle(s)

Ambulance

Police

Firetruck (Fire truck)

First responder

First response

## Strategy Formulation

Autonomous+  
Self\_Driv+

automobile+  
vehic+  
car?

Emergency 2D vehic+  
Ambulance+  
Police+  
Fire\_truck+  
First 2D respon+

## Truncations

The ? allows for zero or one character only  
The + allows for unlimited characters

**NOTE:** CAR is a short word and we do not want longer words like CARGO, CARRYOVER, CARTOGRAPHY...  
-> don't use the + truncation

More info on 'Build queries using truncations and operators' [here](#)

## Operators

The 2D finds the terms within two words of each other in any order

## Initial Strategy

((AUTONOMOUS+ OR SELF\_DRIV+) 4D (AUTOMOBIL+ OR VEHIC+ OR CAR?)))

/TI/AB/IW/CLMS/DESC/ODES/OBJ/ADB/ICLM/KEYW/TX

AND

((EMERGENCY 2D VEHIC+) OR AMBULANCE+ OR POLICE+ OR FIRE\_TRUCK+ OR  
(FIRST 2D RESPON+))) /TI/AB/IW/CLMS/ICLM/DESC/ODES/OBJ/ADB/KEYW/TX )

Advanced search

Keywords

1 /backs, Independent Claims, Full Text ((AUTONOMOUS+ OR SELF\_DRIV+) 4D (AUTOMOBIL+ OR VEHIC+ OR CAR?)))

2 /backs, Independent Claims, Full Text (((EMERGENCY 2D VEHIC+) OR AMBULANCE+ OR POLICE+ OR FIRE\_TRUCK+ OR (FIRST 2D RESPON+)))

3 /backs, Independent Claims, Full Text E.g.: Telecom+ OR phone

4 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

5 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

6 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

7 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

8 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

9 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

10 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

11 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

12 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

13 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

14 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

15 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

16 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

17 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

18 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

19 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

20 Title, Abstract, Claims, Description, Object of invention, Advantages over prior art drawbacks, Independent Claims, Full Text

## Strategy Formulation

### Advanced search

#### Numbers, dates & country

Publ. number

Date:

Patents published in (patent authorities):

#### Legal status

Status:

Legal events:

Expiration date:

#### Litigations & oppositions

#### More fields

#### Collections

- Search in: ☒ world patents (full text & biblio) grouped by invention-based families (FamPat)
- ☐ world patents (full text & biblio) displayed by individual country (FullPat)
- ☐ 63 authorities (full text only) displayed by individual country (Full Text)

Limit to recent publication:



## Strategy Formulation – Broad Search

Patent families (FamPat) - 13339 results			Non-patent literature (NPL)
<div> <input checked="" type="checkbox"/> Select                  </div>			
#		Title	Publication number
1	<input type="checkbox"/>	<b>Autonomous</b> driving system and method for <b>vehicles</b> and <b>vehicle</b> including the same	US20200183384
2	<input type="checkbox"/>	Control device and method of lane changing in <b>autonomous</b> driving <b>vehicle</b>	KR10-2018-0043144
3	<input type="checkbox"/>	<b>Autonomous vehicle</b> enhancement system	WO2018/208789
4	<input type="checkbox"/>	Method and device for detecting <b>emergency vehicles</b> in real time and planning driving routes to cope with situations to be expected to be occurred by the <b>emergency vehicles</b>	US20200250974
5	<input type="checkbox"/>	<b>Autonomous vehicle</b> operation apparatus and <b>autonomous vehicle</b> operation method	WO2017/077598
6	<input type="checkbox"/>	<b>Emergency vehicle</b> passage supporting device, <b>emergency vehicle</b> passage supporting program, and <b>emergency vehicle</b> passage supporting system	JP2018116409
7	<input type="checkbox"/>	Controlling <b>autonomous vehicles</b> to provide automated <b>emergency response</b> functions	WO2018/064267
8	<input type="checkbox"/>	A physical model and machine learning combined method to simulate <b>autonomous vehicle</b> movement	WO2018/063428
9	<input type="checkbox"/>	<b>Autonomous vehicle</b> operated with guide assistance	WO2016/183525
10	<input type="checkbox"/>	<b>Autonomous</b> driving <b>vehicle</b> and control method of <b>autonomous</b> driving <b>vehicle</b>	WO2017/018852
11	<input type="checkbox"/>	System and method for providing inter- <b>vehicle</b> communications amongst <b>autonomous vehicles</b>	US20170352200
12	<input type="checkbox"/>	<b>Autonomous vehicle</b> operational management control	WO2018/147872
13	<input type="checkbox"/>	<b>Autonomous vehicle</b> control systems with collision detection and <b>response</b> capabilities	WO2018/144041
14	<input type="checkbox"/>	Control system for <b>autonomous-capable vehicles</b>	WO2017/040689
15	<input type="checkbox"/>	<b>Emergency</b> management system for <b>autonomous vehicle</b> <b>autonomous vehicle</b> apparatus	KR10-2021-0005757

## Strategy Formulation – Narrow Search

Advanced search

Keywords

Claims

Claims

Classifications

Names

Numbers, dates & country

Publ. number

Upload File

Date: Priority  2000-10-21

Patents published in (patent authorities):

Legal status

Status: Alive  in

Legal events:

Expiration date:

Litigations

More fields

Collections

Search in: ☐ world patents (full text & biblio) grouped by invention-based families (FamPat)

☒ world patents (full text & biblio) displayed by individual country (FullPat)

☐ 63 authorities (full text only) displayed by individual country (Full Text)

## Strategy Formulation – Narrow Search




























### Legal status

Status:	Alive	No restriction	in selected countries:	Any country E.g.: US, EP
Legal events:	No restriction (alive or dead)			
	Alive			
	Dead			
Expiration date:	No Restriction			

Specify **Alive** to focus on grants and pending applications for an FTO; not necessary when conducting a prior art search.

Can also specify grant/patent under “No restriction” and specify jurisdictions, if desired.

## Strategy Formulation – Narrow Search

Patents (FullPat) - 129 results		Non-patent literature (NPL)	
<div>Select       </div>			
#	<input type="checkbox"/>	Title	Publication number
1.	<input type="checkbox"/>	 System and method for providing inter-vehicle communications amongst autonomous vehicles	EP3253084
2.	<input type="checkbox"/>	 Method, system and emergency control device for traffic management of autonomous vehicles in emergency situations	EP3614223
3.	<input type="checkbox"/>	 Method for determining command delays of autonomous vehicles	EP3327530
4.	<input type="checkbox"/>	 Autonomous traveling system and method for vehicles and vehicle hence -	DE102019117493
5.	<input type="checkbox"/>	 Guiding device for autonomous vehicle and method thereof	DE102020124687
6.	<input type="checkbox"/>	 Method for accessing supplemental perception data from other vehicles	WO2019/133743
7.	<input type="checkbox"/>	 Autonomous vehicle control system and autonomous vehicle control method using the same	DE102020206946
8.	<input type="checkbox"/>	 A system delay estimation method for autonomous vehicle control	EP3341265
9.	<input type="checkbox"/>	 Systems and methods for operating an autonomous vehicle in a presence of hazardous materials	WO2019/241196
10.	<input type="checkbox"/>	 Operating mode of an autonomous vehicle use	DE102016125275
11.	<input type="checkbox"/>	 Transitioning a mixed-mode vehicle to autonomous mode	EP2707783
12.	<input type="checkbox"/>	 Vehicle outer surface of object detection	DE102017113186
13.	<input type="checkbox"/>	 Method and device for influencing a traffic control device	EP3223257
14.	<input type="checkbox"/>	 Method and device for influencing of autonomous change light systems	DE102018123153
15.	<input type="checkbox"/>	 Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment	DE102018120723
16.	<input type="checkbox"/>	 Detect and respond to emergency vehicles on a roadway	DE102017126790
17.	<input type="checkbox"/>	 Method and device for influencing of autonomous change light systems	DE102018010331
18.	<input type="checkbox"/>	 Use-based insurance companion system	DE102019100567
19.	<input type="checkbox"/>	 Autonomous police vehicle	DE102017115309
20.	<input type="checkbox"/>	 Method and system for determining a route from a motor vehicle location to a destination	EP3405748

03

Review your search results



Review within the Tool

## Review tools

- Customized Filters
- Highlights
- Key content (e.g. independent claims)
- Saving into lists
- Customized display settings (e.g. Images)

The screenshot displays the Questel Patents (FullPat) search results interface. The interface is divided into several sections:

- Left Panel (Filter options):** Contains filters for Legal status (Alive, Granted, Pending), 1st application year (After 2020, 2016-2020, 2011-2015, 2006-2010, Before 2006), Assignee, IPC classification, CPC classification, Publication country, Litigations, and Oppositions.
- Top Bar:** Shows the search results count (35 results) and tabs for Claims, Description, Key content, Concepts, Fulltext, Kwic, and Citations. A 'Display' button is highlighted with a blue box.
- Central Area:** Displays multiple patent abstracts and diagrams. The diagrams include flowcharts, network diagrams, and vehicle diagrams. The abstracts are titled with keywords like 'System and method for prov...', 'Method, system and emerge...', 'Method for accessing suppl...', 'Vehicle outer surface of obje...', 'Operating mode of an auton...', and 'Detect and respond to emer...'.
- Right Panel (Object of Invention):** Provides a detailed description of the invention, including the 'Object of Invention' and a summary of the disclosure. The text describes a system for autonomous vehicles, including a cloud server, a network, and a plurality of autonomous vehicles.

The Questel logo is visible in the bottom left corner.

## Diapositive 22

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LC3

Add link to KB articles

Loris Caruana, 15/10/2021

Highlighting

Highlights

Find your keywords quickly in the text

The screenshot displays the Questel Patents (FullPat) interface. The main window shows a list of patents with columns for #, Title, Publication, App. date, Applicant/Assignee, and a percentage. A red box highlights the 'Highlight Wizard' icon in the top toolbar. A red arrow points from this icon to the 'Highlight Wizard' dialog box, which is open in the foreground. The dialog box has a 'Highlight' section with a text input field containing 'autonomous+, self\_driv+, automobil+, vehic+, car?'. Below this, there is a 'My profiles' dropdown set to 'Current'. To the right of the input field, there are two checkboxes: one for 'autonomous+, self\_driv+, automobil+, vehic+, car?' (checked) and one for 'emergency, vehic+, first, respon+, ambulance+, police+, fire\_t' (checked). At the bottom of the dialog, there is a checkbox for 'Make above highlighting persistent' (unchecked) and buttons for 'Clear', 'Apply', 'Ok', and 'Close'.

#	Title	Publication	App. date	Applicant/Assignee	
1.	System and method for providing inter-vehicle communications amongst autonomous vehicles	EP3253084	2016-11-29	SAUDU	100 %
2.	Method, system and emergency control device for traffic management of autonomous vehicles in emergency situations	EP3614223	2018-08-24	BOEING	93 %
3.	Method for accessing supplemental perception data from other vehicles	WO2019/133743	2018-12-27	DRIVE AI	88 %
4.	Vehicle outer surface of object detection	DE102017113186	2017-06-14	FORD GLOBA...	87 %
5.	Operating mode of an autonomous vehicle use	DE102016125275	2016-12-21	FORD GLOBA...	86 %

**Highlight Wizard**

**Highlight**

Fill in the form to highlight specific terms.

My profiles : Current

autonomous+, self\_driv+, automobil+, vehic+, car? ☒

emergency, vehic+, first, respon+, ambulance+, police+, fire\_t ☒

Add another highlight color

☐ Make above highlighting persistent

Clear Apply Ok Close ?

**Claims**

1. A computer-implemented method for inter-vehicle communications amongst autonomous vehicles (101), the method comprising: transmitting (602), by a first autonomous vehicle a vehicle identifier, ID, and vehicle information of a first autonomous vehicle (101) to a cloud server (102) over a network (103), wherein the cloud server (102) is communicatively coupled to a plurality of autonomous vehicles (101); receiving (603), by the first autonomous vehicle a list of one or more vehicle identifiers, IDs, from the cloud server (102), the vehicle IDs identifying one or more autonomous vehicles (101) that are within a predetermined geographic proximity of the first autonomous vehicle (101), wherein the cloud server (102) maintains a neighboring vehicle data structure storing geographic neighboring information of the plurality of autonomous vehicles (101) based on their respective vehicle information periodically received from the plurality of autonomous vehicles (101), and identifies the one or more autonomous vehicles (101) using a nearest neighbor search algorithm, wherein the neighboring vehicle data structure comprises a k-dimensional, k-d, tree, and the k-d tree comprises a plurality of nodes in a hierarchical structure, each node corresponding to one of the plurality of autonomous vehicles (101) managed by the cloud server (102), wherein the k-dimension includes latitude, longitude, and altitude, and traveling directions are integrated into tree nodes; and communicating (605), by the first autonomous vehicle with a second autonomous vehicle that is selected from a first list of the one or more autonomous vehicles (101) via a wireless local area network (103) to exchange an operational status of the first autonomous vehicle with the second autonomous vehicle (101).

2. The method of claim 1, wherein the one or more autonomous vehicles (101) of the first list were identified by the cloud server (102) based on location information of the first autonomous vehicle (101) and location information of the one or more autonomous vehicles (101).

3. The method of claim 1, wherein each vehicle ID of the list includes an Internet protocol, IP, address and a domain associated with a corresponding autonomous vehicle (101) for communications over the wireless local area network (103).

4. The method of claim 1, wherein the operational status includes an indicator indicating that the first autonomous vehicle (101) is about to change from a first lane currently occupied by the first autonomous vehicle (101) to a second lane currently occupied by the second autonomous vehicle (101); or the second autonomous vehicle (101) periodically updates its vehicle information with the cloud server (102), and the second autonomous vehicle (101) receives a second list of one or more nearby autonomous vehicles (101) from the cloud server (102), including the first autonomous vehicle (101).

5. A non-transitory machine-readable medium having instructions stored therein, which when executed by a processor, cause the processor to perform operations of inter-vehicle communications, the operations comprising: transmitting (602) a vehicle identifier, ID, and vehicle information of a first autonomous vehicle to a cloud server (102) over a network (103), wherein the cloud server (102) is communicatively coupled to a plurality of autonomous vehicles (101); receiving (603) a list of one or more vehicle identifiers, IDs, from the cloud server (102), the vehicle IDs identifying one or more autonomous vehicles (101) that are within a predetermined geographic proximity of the first autonomous vehicle (101), wherein the cloud server (102) maintains a neighboring vehicle data structure storing geographic neighboring information of the plurality of autonomous vehicles (101) based on their respective vehicle information periodically received from the plurality of autonomous vehicles (101), and identifies the one or more autonomous vehicles (101) using a nearest neighbor search algorithm, wherein the neighboring vehicle data structure comprises a k-dimensional, k-d, tree, and the k-d tree comprises a plurality of nodes in a hierarchical structure, each node corresponding to one of the plurality of autonomous vehicles (101) managed by the cloud server (102), wherein the k-dimension includes latitude, longitude, and altitude, and traveling directions are integrated into tree nodes; and



## Diapositive 23

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**LC4**

Add KB article's link

Loris Caruana, 15/10/2021

Class Codes

Find class codes

Patents (FullPat) - 129 results Non-patent literature (NPL)

Select: 129

# Title Publication number

1. System and method for providing inter-vehicle communication for autonomous vehicle

2. Method, system and emergency control system for emergency situations

3. Method for determining command delays for autonomous vehicle

4. Autonomous traveling system and method for autonomous vehicle

5. Guiding device for autonomous vehicle

6. Method for accessing supplemental perception information for autonomous vehicle

7. Autonomous vehicle control system and autonomous vehicle control method using the same

8. A system delay estimation method for autonomous vehicle control

9. Systems and methods for operating an autonomous vehicle in a presence of hazardous conditions

10. Operating mode of an autonomous vehicle use

11. Transitioning a mixed-mode vehicle to autonomous mode

12. Vehicle outer surface of object detection

13. Method and device for influencing a traffic control device

14. Method and device for influencing of autonomous change light systems

15. Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment

Top assignees  
Top CPC classes  
Top US classes  
Top International classes  
Top FI terms  
Top FTM terms  
Concepts

Analyze from selected records

TOP 50 IPC codes analysis

Please select the International Codes you want to use to refine your search.

Percent	IPC codes
17.05%	G08G-001/16
13.17%	G05D-001/02
10.85%	G08G-001/0965
9.30%	B60W-030/08
6.97%	B60R-016/02
6.97%	B60W-040/02
6.97%	B60W-050/00
6.20%	G01C-021/34
6.20%	G08G-001/00
5.42%	G05D-001/00
5.42%	G08G-001/0968
4.65%	B60W-010/04
4.65%	B60W-010/20
4.65%	B60W-050/14
3.87%	B60W-030/00

## Strategy Formulation

Autonomous+  
Self\_Driv+  
Driverless

automobile+  
vehic+  
car?

Emergency 2D vehic+  
Ambulance+  
Police+  
Fire\_truck+  
First 2D respon+

(G08G-001/16)/IPC

## Advanced search

### Keywords

Claims

((AUTONOMOUS+ OR SELF\_DRIV+) 4D (AUTOMOBIL+ OR VEHIC+ OR CAR?))

Claims

((((EMERGENCY 2D VEHIC+) OR AMBULANCE+ OR POLICE+ OR FIRE\_TRUCK+ OR (FIRST 2D RESPON+)))

### Classifications

and

IPC, CPC

G08G-001/16

### Names

### Numbers, dates & country

Publ. number

E.g.: EP0980063

Upload File

Date:

Priority

From

2000-10-21

Patents published in (patent authorities):

E.g.: US, EP

### Legal status

Status:

Alive

No restriction

in  
selected  
countries:

DE

Disclaimer

Strategy narrowed by jurisdiction, priority date and claims  
AND IPC/CPC code

(( (AUTONOMOUS+ OR SELF\_DRIV+ OR DRIVERLESS) 4D (AUTOMOBIL+  
OR VEHIC+ OR CAR?))/CLMS)

AND























(( ( ( (EMERGENCY 2D VEHIC+) OR AMBULANCE+ OR POLICE+ OR  
FIRE\_TRUCK+ OR (FIRST 2D RESPON+) ) /CLMS

AND ( (G08G-001/16)/IPC/CPC) ))

AND PRD >= 2000-10-21 AND

( STATE/ACT=ALIVE P (PC/ACT=DE OR CC/ACT=DE) )

## Limit by IPC/CPC code

Patents (FullPat) - 35 results		Non-patent literature (NPL)	
<div>Select       </div>			
#		Title	Publication number
1.		System and method for providing inter-vehicle communications amongst autonomous vehicles	EP3253084
2.		Method, system and emergency control device for traffic management of autonomous vehicles in emergency situations	EP3614223
3.		Method for accessing supplemental perception data from other vehicles	WO2019/133743
4.		Vehicle outer surface of object detection	DE102017113186
5.		Operating mode of an autonomous vehicle use	DE102016125275
6.		Detect and respond to emergency vehicles on a roadway	DE102017126790
7.		Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment	DE102018120723
8.		Emergency management system and method for controlling at least one autonomous vehicle in an emergency	DE102017211797
9.		Emergency evacuation communicate via autonomous driving	DE102017125494
10.		Method for collision avoidance of a motor vehicle with an insert vehicle and a corresponding system and motor vehicle	DE102015226232
11.		Systems and methods for use of vehicles in an autonomous vehicle react up	DE102018114600
12.		Accelerometer based external noise control for voice-controlled autonomous parking	DE102018124422
13.		Collision preventing for an open based digital behavior twin vehicle_status connected region of an control of the user	DE102019115783
14.		An emergency handling system for an autonomous driving vehicle (adv)	EP3323687
15.		Path and speed optimization fallback mechanism for autonomous vehicles	EP3517893

04

Develop your search strategy

## Further considerations

At this point in the search, you have a few possible decisions that you can make:

1. You can add more keywords, class codes, etc., based upon further research, or comments from the requester
2. You can narrow the search using additional operators to focus the search
3. You can opt for different type of searches available in Orbit intelligence



# Semantic Search

Much goes on in the background, but the input should read like a description. You can use a disclosure, a summary of the invention, an abstract of a patent, or merged information.

**Semantic search**

**Free text** ⓘ

An emergency vehicle traffic light preemption system for preemption of traffic lights at an intersection to allow safe passage of emergency vehicles. The system includes a real-time status monitor of an intersection which is relayed to a control module for transmission to emergency vehicles as well as to a central dispatch office. The system also provides for audio warnings at an intersection to protect pedestrians who may not be in a position to see visual warnings or for various reasons cannot hear the approach of emergency vehicles. A transponder mounted on an emergency vehicle provides autonomous control so the vehicle operator can attend to getting to an emergency and not be concerned with the operation of the system. Activation of a priority-code (i.e. Code-3) situation provides communications with each intersection being approached by an emergency vehicle and indicates whether the intersection is preempted or if there is any conflict with other approaching emergency vehicles. On-board diagnostics handle various information including heading, speed, and acceleration sent to a control module which is transmitted to an intersection and which also simultaneously receives information regarding the status of an intersection. Real-time communications and operations software allow central and remote monitoring, logging, and command of intersections and vehicles.

1. An emergency vehicle traffic control system comprising: a processor; and a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including: receiving navigation information of an emergency vehicle approaching an intersection equipped with one or more vehicular traffic lights;

*Describe the technology you want to search in plain english or copy and paste the content from another document. At least a paragraph of text is expected.*

**Non English text will be sent to a 3rd party for translation**

[Custom search wizard](#)

**^ Collections**

Search in: ☒ world patents (full text & biblio) grouped by invention-based families (FamPat) ⓘ  
☐ world patents (full text & biblio) displayed by individual country (FullPat) ⓘ

**Semantic search**

**Free text** ⓘ

An emergency vehicle traffic light preemption system for preemption of traffic lights at an intersection to allow safe passage of emergency vehicles. The system includes a real-time status monitor of an intersection which is relayed to a control module for transmission to emergency vehicles as well as to a central dispatch office. The system also provides for audio warnings at an intersection to protect pedestrians who may not be in a position to see visual warnings or for various reasons cannot hear the approach of emergency vehicles. A transponder mounted on an emergency vehicle provides autonomous control so the vehicle operator can attend to getting to an emergency and not be concerned with the operation of the system. Activation of a priority-code (i.e. Code-3) situation provides communications with each intersection being approached by an emergency vehicle and indicates whether the intersection is preempted or if there is any conflict with other approaching emergency vehicles. On-board diagnostics handle various information including heading, speed, and acceleration sent to a control module which is transmitted to an intersection and which also simultaneously receives information regarding the status of an intersection. Real-time communications and operations software allow central and remote monitoring, logging, and command of intersections and vehicles.

1. An emergency vehicle traffic control system comprising: a processor; and a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including: receiving navigation information of an emergency vehicle approaching an intersection equipped with one or more vehicular traffic lights;

*Describe the technology you want to search in plain english or copy and paste the content from another document. At least a paragraph of text is expected.*

**Non English text will be sent to a 3rd party for translation**

[Custom search wizard](#)

**^ Collections**

Search in: ☒ world patents (full text & biblio) grouped by invention-based families (FamPat) ⓘ  
☐ world patents (full text & biblio) displayed by individual country (FullPat) ⓘ

**Tip:** To avoid too much noise don't use just a few keywords

## Diapositive 31

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LC5

insert KB link

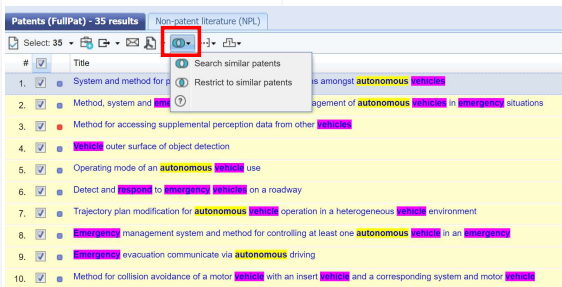
Loris Caruana, 15/10/2021

# Similarity Search

Similarity

Run a similarity search on a selection or list based on:

- Concept extraction
- Classification Code
- Citation



Patents (FullPat) - 35 results

Non-patent literature (NPL)

Select 35

Search similar patents

Restrict to similar patents

1. System and method for... amongst autonomous vehicles

2. Method, system and... management of autonomous vehicles in emergency situations

3. Method for accessing supplemental perception data from other vehicles

4. Vehicle outer surface of object detection

5. Operating mode of an autonomous vehicle use

6. Detect and respond to emergency vehicles on a roadway

7. Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment

8. Emergency management system and method for controlling at least one autonomous vehicle in an emergency

9. Emergency evacuation communicate via autonomous driving

10. Method for collision avoidance of a motor vehicle with an insert vehicle and a corresponding system and motor vehicle

11. Systems and methods for use of vehicles in an autonomous vehicle react up

12. Accelerometer based external noise control for voice-controlled autonomous parking

13. Collision preventing for an open based digital behavior twin vehicle, status connected region of an control of the user

14. An emergency handling system for an autonomous driving vehicle (adv)

15. Path and speed optimization feedback mechanism for autonomous vehicles

Publication number	App. date	Applicant/Assignee	Relevance
EP3253084	2016-11-29	Baidu	100 %
EP3614223	2018-08-24	BOEING	93 %
WO2019133743	2018-12-27	DRIVE AI	88 %
DE102017113186	2017-06-14	FORD GLOBAL...	87 %
DE102016125275	2016-12-21	FORD GLOBAL...	86 %
DE102017126790	2017-11-14	FORD GLOBAL...	85 %
DE102018120723	2018-08-24	TOYOTA RES.	84 %
DE102017211787	2017-07-11	ROBERT BOSCH	80 %
DE102017125494	2017-10-30	FORD GLOBAL...	79 %
DE102015226232	2015-12-21	BMW - BAYE...	77 %
DE102018114600	2018-06-18	GM GLOBAL...	73 %
DE102018124422	2018-10-02	FORD GLOBAL...	72 %
DE102019115783	2019-06-11	TOYOTA MOTOR	70 %
EP3323687	2017-09-15	Baidu	70 %
EP3517893	2019-01-21	Baidu	67 %

Sorted by  
relevance



User  
settings

Relevance score shown in result list:

YES

Limitation of results number for similarity search up to

maximum 10000 results

## Diapositive 32

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- LC6** NB: Penser à analyser le contenu  
de l'onglet 'KWIC' pour étudier  
quelles similitudes ont été trouvées  
Loris Caruana, 15/10/2021
- LC7** Change slide pattern  
Loris Caruana, 15/10/2021

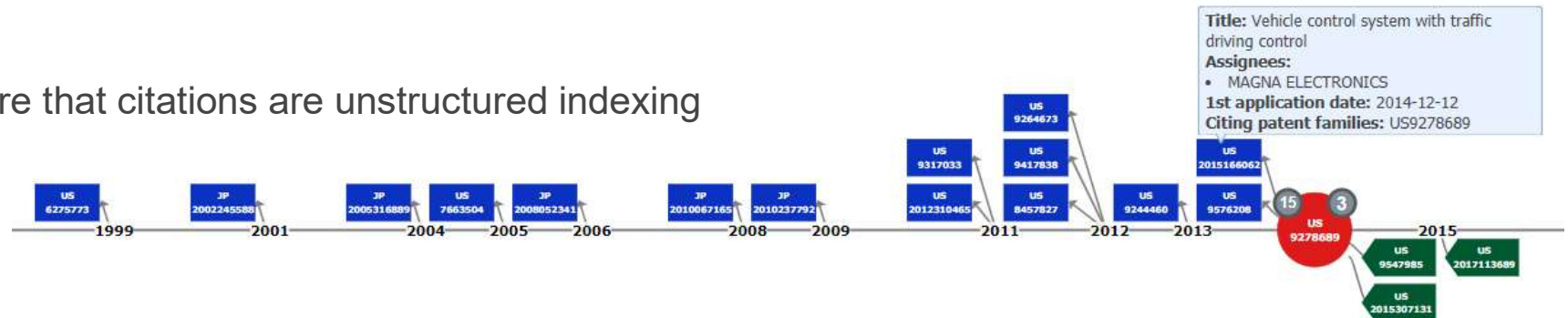
## Citation search

Citations

Patents (FullPat) - 35 results		Non-patent literature (NPL)			
Select: 35					
#	✓	Title	Publication number	App. date	Applicant/Assignee
1.	✓	System and method for providing autonomous vehicles	EP3253084	2016-11-29	BAIDU
2.	✓	Method, system and emergency autonomous vehicles in emergency	EP3614223	2018-08-24	BOEING
3.	✓	Method for accessing supplementary			
4.	✓	Vehicle outer surface of object detection	DE102017113186	2017-06-14	FORD GLOBAL...
5.	✓	Operating mode of an autonomous vehicle use	DE102016125275	2016-12-21	FORD GLOBAL...
6.	✓	Detect and respond to emergency vehicles on a roadway	DE102017126790	2017-11-14	FORD GLOBAL...
7.	✓	Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment	DE102018120723	2018-08-24	TOYOTA RES...
8.	✓	Emergency management system and method for controlling at least one autonomous vehicle in an emergency	DE102017211797	2017-07-11	ROBERT BOSCH
9.	✓	Emergency evacuation communicate via autonomous driving	DE102017125494	2017-10-30	FORD GLOBAL...
10.	✓	Method for collision avoidance of a motor vehicle with an insert vehicle and a corresponding system and motor vehicle	DE102015226232	2015-12-21	BMW - BAYE...
11.	✓	Systems and methods for use of vehicles in an autonomous vehicle react up	DE102018114600	2018-06-18	GM GLOBAL ...
12.	✓	Accelerometer based external noise control for voice-controlled autonomous parking	DE102018124422	2018-10-02	FORD GLOBAL...
13.	✓	Collision preventing for an open based digital behavior twin vehicle_status connected region of an control of the user	DE102019115783	2019-06-11	TOYOTA MOTOR
14.	✓	An emergency handling system for an autonomous driving vehicle (adv)	EP3323687	2017-09-15	BAIDU
15.	✓	Path and speed optimization fallback mechanism for autonomous vehicles	EP3517893	2019-01-21	BAIDU

The applicant/examiner can control the backwards citations, but not the forward ones  
Both types of citations are useful in finding art that may have been missed by other means

Be aware that citations are unstructured indexing



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## Diapositive 33

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LC8

Link to KB

Loris Caruana, 15/10/2021

Limitation on Lapsed

## Expand Search

For further assurance, run the search on lapsed patents with the help of the command line in your Search History

The screenshot shows the Questel patent search interface. On the left is a navigation menu with sections: Searches (Easy search, Advanced search, Semantic search, Number search, Biosequence search), My session (Search history, Search results, Console), Past sessions (Previous history), My searches (My saved searches, My alerts), and My recent lists. The 'Search history' item is highlighted with a red box. The main area displays a table of search history with columns: Search Step, Result(s), Query, Assistant, Source, and Action. Two search steps are listed. The first step (1) has 6472 results and a complex query. The second step (2) has 985 results and the query '1 AND (STATUS/ACT=LAPSED)', which is highlighted with a red box. Below the table, there is a section for 'Combine strategies' with a text input field containing '1 AND (STATUS/ACT=LAPSED)', also highlighted with a red box. A large red arrow points upwards towards this input field.

Search Step	Result(s)	Query	Assistant	Source	Action
2	985	1 AND (STATUS/ACT=LAPSED)	Search history	FULLPAT	Show results • Modify • Save • Alert • Delete
1	6472	(( (AUTONOMOUS+ OR SELF_DRIV+ OR DRIVERLESS) 4D (AUTOMOBIL+ OR VEHIC+ OR CAR?)/CLMS) AND ((( (EMERGENCY 2D VEHIC+) OR AMBULANCE+ OR POLICE+ OR FIRE_TRUCK+ OR (FIRST 2D RESPON+ ) /CLMS OR ( (G08G-001/16)/IPC/CPC ) ) AND PRD >= 2000-10-21	Advanced search	FULLPAT	Show results • Modify • Save • Alert • Delete

Combine strategies. E.g.: (1 or 2) not 3, 1 and (phone+)

1 AND (STATUS/ACT=LAPSED)

## Diapositive 34

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LC9

Link to KB

Loris Caruana, 15/10/2021



Output

Output



**Analysing**



**Exporting**

Formats that are useful  
for FTO  
Backup/Recovery  
Checking/Importance



**Sharing**



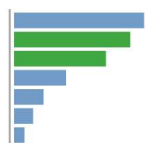
**Monitoring**



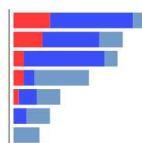
**Questel**

Analysis

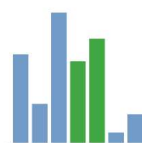
## Analyze Search Data to Deliver Business Insights



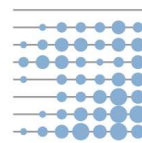
Key players



Key players by legal status



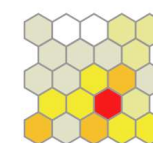
Investment trend



Investment trend for key players



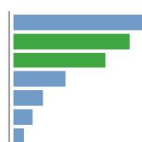
Markets & competitors location



Technology overview



Key players by technical domain



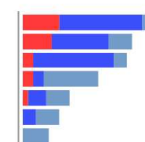
Key inventors



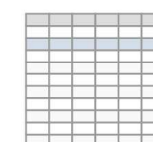
Landscape by technology clusters



Technologies & applications



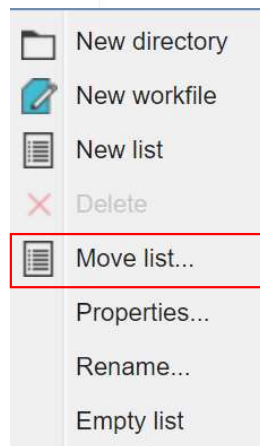
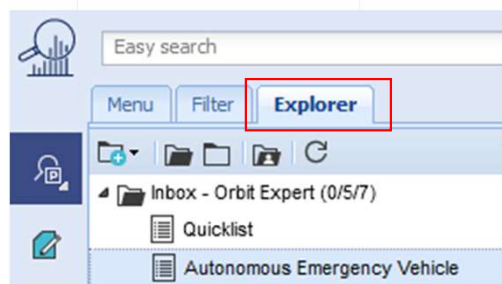
Key inventions by players



Key invention metrics

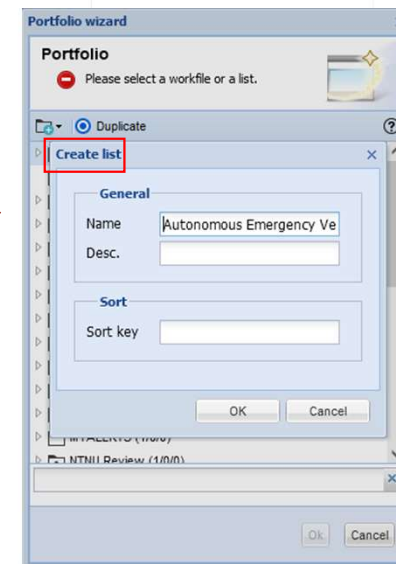
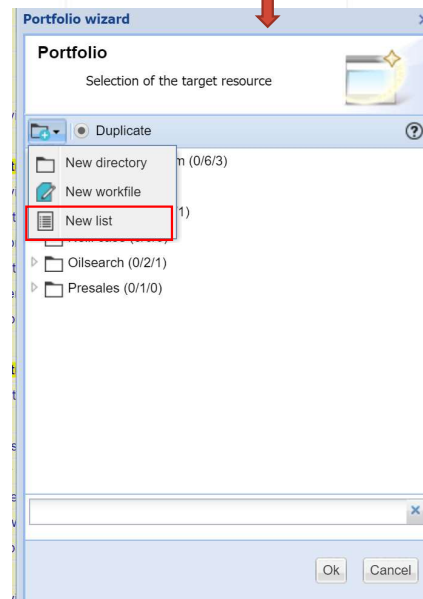
Output

Store Relevant Results in a List and Manage it



The screenshot shows a table of patent results. A 'Move or duplicate' dialog box is open, showing the selected records in a folder as a List or Workfile. The table has columns for 'Publication number', 'App. date', 'Applicant/Assignee', and 'Display'. The table contains 14 rows of patent data.

#	Patent	Publication number	App. date	Applicant/Assignee	Display
1.	System for managing autonomous vehicles	EP3253084	2016-11-29	BAIDU	100 %
2.	Method system and emergency control device for traffic management of autonomous vehicles in emergency situations	EP3614223	2018-08-24	BOEING	93 %
3.	Method for accessing supplemental perception data from other vehicles	WO2019/133743	2018-12-27	DRIVE AI	88 %
4.	Vehicle outer surface of object detection	DE102017113186	2017-06-14	FORD GLOBA...	87 %
5.	Operating mode of an autonomous vehicle use	DE102016125275	2016-12-21	FORD GLOBA...	86 %
6.	Detect and respond to emergency vehicles on a roadway	DE102017126790	2017-11-14	FORD GLOBA...	85 %
7.	Trajectory plan modification for autonomous vehicle operation in a heterogeneous vehicle environment	DE102018120723	2018-08-24	TOYOTA RES...	84 %
8.	Emergency management system and method for controlling at least one autonomous vehicle in an emergency	DE102017211797	2017-07-11	ROBERT BOSCH	80 %
9.	Emergency evacuation communicate via autonomous driving	DE102017125494	2017-10-30	FORD GLOBA...	79 %
10.	Method for collision avoidance of a motor vehicle with an insert vehicle and a corresponding system and motor vehicle	DE102015226232	2015-12-21	BMW - BAYE...	77 %
11.	Systems and methods for use of vehicles in an autonomous vehicle react up	DE102018114600	2018-06-18	GM GLOBAL T...	73 %
12.	Accelerometer based external noise control for voice-controlled autonomous parking	DE102018124422	2018-10-02	FORD GLOBA...	72 %
13.	Collision preventing for an open based digital behavior twin vehicle_status connected region of an control of the user	DE102019115783	2019-06-11	TOYOTA MOTOR	70 %
14.	An emergency handling system for an autonomous driving vehicle (adv)	EP3323687	2017-09-15	BAIDU	70 %



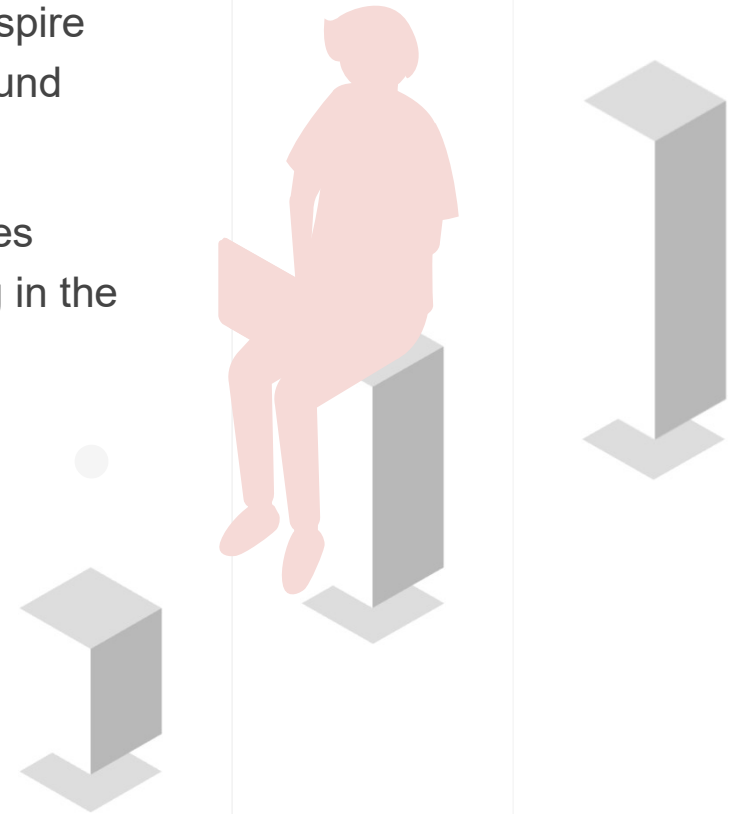
05

## End Product & Legal information

## End Product

The combination of these approaches should inspire confidence that the most relevant items were found

Any hits that are duplicated within these searches simply indicates patents that are worth including in the final results



## Legal Status and Litigation



An FTO is a legal decision, but it is helpful to know what other companies are patenting in the same area

Knowing how litigious a company is can be very useful in determining the risk of practicing an invention in an area in which the claims may be interpreted broadly

Check legal status and litigation information

Obtaining a legal opinion as to whether a product, process or service may be considered to infringe any patent(s) owned by others

06

## Conclusions

## Summary

- Create a broad search query using building blocks
- Run keyword search, using advanced features (operators, truncations, specific text field)
- Tweak strategy based upon retrieval, including class codes
- Use advanced features to add more to recall, without affecting precision adversely (citations, semantic, similarity)
- Export and/or save in a format that streamlines your team's process
- Use Analysis module for additional insights and potential search modification



**LC11**

Pour résumer nous avons

Lancé une 1ere recherche assez vaste

Puis lancé une recherche avancée sur des mots-clés et des codes de classification, puis l'avons ajustée

Ensuite, nous avons complété avec les recherches de citations, sémantique, et similarité

Puis nous avons rapidement mentionné comment analyser, sauvegarder, exporter partager ces résultats.







Loris Caruana, 15/10/2021

## Deliverables

# Freedom to operate

- ✓ Report in DOC, XLS, PPT or Client specific format
- ✓ List of selected documents ranked according to their threat to the exploitation of the Client's product or solution
- ✓ Comments on the presence of additional specifications (restrictions) in the independent claims of the relevant references not anticipated by the Client's product or solution
- ✓ PDF of original documents, machine translation extract whenever necessary
- ✓ Upload of list of results directly on Client's Orbit Intelligence account

## Results analysis

S.No	Publication Number	Front Page Drawing	Relevant Claims	Relevant Excerpts from Specifications	Relevant Figures	Feature Mapping				Comment	Additional Features in Independent Claim not disclosed in the invention described by the CLIENT. - Green: low risk - Orange: potentially risky, but patent application not granted -> to be monitored - Red: risky - no additional feature in ind. Claims	Legal Status
						F1	F2	F3	F4			
1	<a href="#">US7254429B2</a>		1. A method of monitoring the blood glucose concentration within a biological tissue comprising the steps of: providing light having scattering properties sensitive to the glucose concentration within the tissue.	A second example would be a first wavelength of about 1310 nm and a second wavelength of about 1450 nm. At this second wavelength, the scattering coefficients for blood and water are similar to those of the first wavelength. However, the absorption coefficient for water at this second wavelength is substantially lower than that of the first.	Fig. 3, 4	Y1	Y2	Y	N	The patent reference claims a method of monitoring the blood glucose concentration. Infrared light is scanned over tissue area and based on detected scattered light.	The patent reference also claims splitting light into a sample beam and a reference beam, and interfering the reflected light with the reference beam.	Event date: 2009/09/08
2	<a href="#">US10366269B2</a>		1. An apparatus, comprising: an ultrasonic sensor array; a light source system; a display; and a control system comprising one or more processors.	In some examples, a control system of the mobile device 1100 (which may include a control system of the apparatus 200) may be capable of selecting one or more wavelengths of the light emitted by the apparatus 200. In some examples, the control system may be capable of selecting one or more wavelengths of light to be transmitted to the target.	Fig. 2, 4, 6	Y3	Y	N	N	The patent reference claims an apparatus which estimates blood glucose level. A light source (laser) emits infrared and acoustic waves.	The patent reference also claims that a control system selects acquisition time delay for the reception of acoustic wave.	Event date: 2019/07/10 Event code: STCP Code Expl.: INFORMATION ON STATUS: PATE
3	<a href="#">US20200352450A1</a>		1. An analyte monitor comprising: a light emitter to emit light toward a target; a sensor to sense acoustic waves generated by analyte molecules in the target.	[0026] According to a fourth aspect, there is provided a photoacoustic method for estimating analyte concentration levels in a target. The method includes the step of measuring an impedance of the target via electrical impedance spectroscopy. The method also includes the step of illuminating the target with a light source.	Fig. 1, 3	Y3	Y	N	N	The patent reference claims an glucose monitoring. A light in mid-infrared region is emitted and acoustic waves are sensed by microphone.	The patent reference also claims a voltage controller to bias coupled electrodes.	Event date: 2020/11/19 Event code: AS Code Expl.: ASSIGNMENT NEW CLAIMED
4	<a href="#">US20190159705A1</a>		1. A method for predicting blood glucose in a body using a photoacoustic spectroscopy (PAS), comprising: acquiring a PAS signal by irradiating light to skin of the body;	[0018] According to another exemplary embodiment, a sensor for predicting blood glucose in a body using a photoacoustic spectroscopy (PAS) is provided. The sensor includes: a light emitter configured to emit light to skin of the body; an acoustic resonator configured to receive the light.	Fig. 1, 2	Y3	Y	N	N	The patent reference claims a method to predict blood glucose in a body using a photoacoustic spectroscopy (PAS). A light source is used to illuminate the body.	The examination has not started yet in the US.	Event date: 2019/02/21 Event code: STPP Code Expl.: INFORMATION ON STATUS: PATE
5	<a href="#">US8326388B2</a>		1. An apparatus for non-invasive measurement of living body characteristics, comprising: a light source configured to generate light containing a specific wavelength.	In the light source unit 8, it is preferable to use one or plural light emitting devices such as a laser diode (LD) or light-emitting diode (LED) emitting a specific wavelength component within a range of 600 to 5000 nm. As an example of the present invention, light of a wavelength component from 400 nm to 3600 nm is used.	Fig. 1, 6	Y3	Y	N	N	The patent reference claims an apparatus for non-invasive measurement of living body characteristics such as glucose. A light of 400 to 5000 nm wavelength is emitted.	The patent reference also claims a piezoelectric device which is formed of a piezoelectric single crystal containing lead titanate and the piezoelectric single crystal has a transmittance of about 70% to the specific wavelength component of 400 to 6000 nm.	Event date: 2020/05/21 Event code: MAFF Code Expl.: MAINTENANCE FE
6	<a href="#">WO2019235184A1</a>		1. A light beam of a wavelength absorbed glucose measurement site and the irradiation part, wherein the beam is emitted from the light emission unit.	The drive circuit 203, oscillator 209 receives a signal transmitted from the first signal line 1 connected to supply drive power to the light source 201, the first light source 204 emits light 4 204 to the first light source 4 for	-	Y3	Y4	Y	N	The patent reference claims glucose measurement and moisture measurement. A light beam is irradiated and acoustic signal is detected.		Event date: 2020/12/08 Event code: NENF Code Expl.: NON-ENTRY INTO THE

Questel

\*XLS format displayed

**LC10**

Voici un exemple de fichier d'export tel que produit par nos services de Consulting:

Liste des documents sélectionnés, classés en fonction de leur menace pour l'exploitation du produit ou de la solution du client.  
Commentaires sur la présence de spécifications additionnelles (restrictions) dans les revendications indépendantes des références pertinentes non anticipées.

Lien vers les PDF des documents originaux, extrait de traduction automatique si nécessaire

A savoir : Nos services de consulting peuvent aussi charger la liste des résultats directement sur le compte Orbit Intelligence du client.

Si ces services vous intéressent, vous pouvez vous tourner vers votre contacte commercial, ou nous en demander les coordonnées si vous avez un doute

Loris Caruana, 15/10/2021

Thank you!

Need more information?

Questions?



CONTACT US  
[help@questel.com](mailto:help@questel.com)

Access our knowledge base :  
<https://intelligence.help.questel.com/support/home>

Visit our website  
[www.questel.com](http://www.questel.com)

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