

Supplementary Material

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1. Search strategies used to identify AI- and COVID-19-related publications indexed in the Web of Science Core Collection

Web of Science Search Strategy (v0.1)

Database: Web of Science Core Collection

Entitlements:

- WOS.SCI: 1945 to 2024
- WOS.AHCI: 1975 to 2024
- WOS.ESCI: 2019 to 2024
- WOS.ISTP: 1990 to 2024
- WOS.SSCI: 1956 to 2024
- WOS.ISSHP: 1990 to 2024

Searches:

1: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2")

Date Run: Mon Apr 08 2024 14:05:55 GMT-0300 (Horário Padrão de Brasília) Results: 5,861

2: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=(bibliometric* OR Scientometric*)

Date Run: Mon Apr 08 2024 14:07:59 GMT-0300 (Horário Padrão de Brasília) Results: 50

3: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=(bibliometric* OR Scientometric*) AND TS=(Patent*)

Date Run: Mon Apr 08 2024 14:08:47 GMT-0300 (Horário Padrão de Brasília) Results: 0

4: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=("network analysis")

Date Run: Mon Apr 08 2024 14:10:18 GMT-0300 (Horário Padrão de Brasília) Results: 33

5: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=("network analysis") AND TS=(Patent*)

Date Run: Mon Apr 08 2024 14:10:47 GMT-0300 (Horário Padrão de Brasília) Results: 0

6: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=(bibliometric* OR Scientometric*) AND TS=("network analysis")

Date Run: Mon Apr 08 2024 14:13:34 GMT-0300 (Horário Padrão de Brasília) Results: 2

7: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR "Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=("systematic review")

Date Run: Mon Apr 08 2024 14:27:58 GMT-0300 (Horário Padrão de Brasília) Results: 119

8: TI=("Artificial Intelligence" OR "Computational Intelligence" OR "Machine Intelligence" OR "Computer Reasoning" OR "Computer Vision System*" OR

"Machine learning" OR "Transfer Learning" OR "Deep Learning" OR "Hierarchical Learning") AND TS=("covid-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS Coronavirus 2") AND TS=("systematic review") AND TS=(Patent*) Date Run:
Mon Apr 08 2024 14:29:48 GMT-0300 (Horário Padrão de Brasília)
Results: 0

2. List of included and excluded patents

Basic Patent Number	Included	Manually excluded	Automatically excluded
AU 2020102250	1	0	0
AU 2020103880	1	0	0
AU 2021100007	1	0	0
AU 2021101034	1	0	0
AU 2021101851	1	0	0
AU 2021102836	1	0	0
AU 2021103135	1	0	0
AU 2021103273	1	0	0
AU 2021103341	1	0	0
AU 2021103550	1	0	0
AU 2021103578	1	0	0
AU 2021104206	1	0	0
AU 2021104313	1	0	0
AU 2021105028	1	0	0
AU 2021105080	1	0	0
AU 2021105808	1	0	0
AU 2021106583	1	0	0
AU 2021107308	1	0	0
CN 111354420	1	0	0
CN 111653356	1	0	0
CN 113034434	1	0	0
CN 113628297	1	0	0
CN 113724886	1	0	0
CN 114187288	1	0	0
CN 114209349	1	0	0
CN 115187519	1	0	0
DE 202022100219	1	0	0
DE 202022102632	1	0	0
IN 202011012766	1	0	0
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IN 202011020103	1	0	0
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IN 202041048260	1	0	0
IN 202111023041	1	0	0
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IN 202111030670	1	0	0
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IN 202241056699	1	0	0
IN 202241059362	1	0	0
JP 2022083341	1	0	0
KR 2022019563	1	0	0
RU 2758649	1	0	0
US 11087883	1	0	0
US 11127506	1	0	0
US 11302448	1	0	0
US 11322260	1	0	0
US 2021307614	1	0	0
US 2021307701	1	0	0
US 2021319900	1	0	0

US 2021327585	1	0	0
US 2022020503	1	0	0
US 2022108803	1	0	0
US 2022165421	1	0	0
US 2022192534	1	0	0
US 2022199266	1	0	0
US 2022240861	1	0	0
US 2022381681	1	0	0
US 2022383984	1	0	0
WO 2021219979	1	0	0
WO 2022010947	1	0	0
WO 2022041396	1	0	0
WO 2022170145	1	0	0
WO 2022208104	1	0	0
WO 2022225794	1	0	0
WO 2022246473	1	0	0
KR 2316631	0	1	0
IN 202111048978	0	1	0
US 2022353664	0	1	0
IN 202221040854	0	1	0
IN 202241057564	0	1	0
IN 202241015491	0	1	0
RD 692058	0	0	1
CN 112070755	0	0	1
IN 202141029727	0	0	1
IN 202041021088	0	0	1
US 2021405689	0	0	1
CN 111986189	0	0	1
IN 202241009195	0	0	1
CN 111932559	0	0	1
IN 202141029138	0	0	1
IN 202021020425	0	0	1
AU 2021107413	0	0	1
IN 202241006172	0	0	1
KR 2309022	0	0	1
IN 202111053730	0	0	1
US 2022005552	0	0	1
WO 2021051045	0	0	1
US 2020286625	0	0	1
IN 202241011460	0	0	1
IN 202241064381	0	0	1
IN 202241021438	0	0	1
KR 2022062154	0	0	1

US 2022277167	0	0	1
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3. Description of IPC codes

N.	International Classifications 8 (1)
42	G06N 20/00: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Machine learning
42	G16H 50/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics -> for computer-aided diagnosis
37	G06K 9/62: Physics -> Computing; Calculating Or Counting -> Graphical Data Reading; Presentation Of Data; Record Carriers; Handling Record Carriers -> Methods or arrangements for recognising patterns -> Methods or arrangements for pattern recognition using electronic means
30	G06N 3/08: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on biological models -> using neural network models -> Learning methods
29	A61B 5/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons
28	G06N 3/04: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on biological models -> using neural network models -> Architecture
26	G06T 7/00: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis
26	G16H 50/80: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics -> for detecting, monitoring or modelling epidemics or pandemics
18	G16H 50/70: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics -> for mining of medical data
15	G16H 10/60: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of patient-related medical or healthcare data -> for patient-specific data
14	G06K 9/00: Physics -> Computing; Calculating Or Counting -> Graphical Data Reading; Presentation Of Data; Record Carriers; Handling Record Carriers -> Methods or arrangements for recognising patterns

12	G06Q 50/22: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for specific business sectors -> Services -> Social work
12	G16H 50/30: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics -> for calculating health indices; for individual health risk assessment
11	A61B 6/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Apparatus for radiation diagnosis
11	A61B 6/03: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Apparatus for radiation diagnosis -> Devices for diagnosis sequentially in different planes; Stereoscopic radiation diagnosis -> Computerised tomographs
9	A61B 5/08: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring devices for evaluating the respiratory organs
8	G06N 3/02: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on biological models -> using neural network models
7	A61B 5/024: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring pulse, heart rate, blood pressure or blood flow; Combined pulse/heart-rate/blood pressure determination; Evaluating a cardiovascular condition not otherwise provided for -> Measuring pulse rate or heart rate
7	G06T 7/11: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Segmentation; Edge detection -> Region-based segmentation
6	A61K 39/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing antigens or antibodies
6	G16H 30/40: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of medical images -> for processing medical images
6	G16H 50/50: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics -> for simulation or modelling of medical disorders
6	H04L-029/08

5	A61B 5/01: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring temperature of body parts
5	A61B 5/0205: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring pulse, heart rate, blood pressure or blood flow; Combined pulse/heart-rate/blood pressure determination; Evaluating a cardiovascular condition not otherwise provided for -> Simultaneously evaluating both cardiovascular conditions and different types of body conditions
5	G06N 7/00: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on specific mathematical models
5	G06Q 10/10: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Administration; Management -> Office automation
5	G06Q 50/00: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for specific business sectors
5	G16H 30/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of medical images -> for handling medical images
5	G16H 40/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices -> for the management or administration of healthcare resources or facilities
4	G06K-009/46
4	G06N 5/02: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements using knowledge-based models -> Knowledge representation
4	G06N 5/04: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements using knowledge-based models -> Inference methods or devices

4	G06Q 30/02: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Commerce -> Marketing
4	G06Q 50/26: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for specific business sectors -> Services -> Government or public services
4	G08B 21/02: Physics -> Signalling -> Signalling Or Calling Systems; Order Telegraphs; Alarm Systems -> Alarms responsive to a single specified undesired or abnormal condition and not otherwise provided for -> Alarms for ensuring the safety of persons
4	G16H 10/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of patient-related medical or healthcare data -> for electronic clinical trials or questionnaires
3	C12N 7/00: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Microorganisms Or Enzymes; Compositions Thereof; Propagating, Preserving, Or Maintaining Microorganisms; Mutation Or Genetic Engineering; Culture Media -> Viruses
3	G01N 21/35: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which incident light is modified in accordance with the properties of the material investigated -> Colour; Spectral properties -> Investigating relative effect of material at wavelengths characteristic of specific elements or molecules -> using infra-red light
3	G05B 13/04: Physics -> Controlling; Regulating -> Control Or Regulating Systems In General; Functional Elements Of Such Systems; Monitoring Or Testing Arrangements For Such Systems Or Elements -> Adaptive control systems -> electric -> involving the use of models or simulators
3	G06N 20/20: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Machine learning -> Ensemble learning
3	G16H 40/67: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices -> for the operation of medical equipment or devices -> for remote operation

3	H04W 4/029: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services making use of location information -> Location-based management or tracking services
3	H04W 4/38: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services specially adapted for particular environments, situations or purposes -> for collecting sensor information
2	A61B 5/021: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring pulse, heart rate, blood pressure or blood flow; Combined pulse/heart-rate/blood pressure determination; Evaluating a cardiovascular condition not otherwise provided for -> Measuring pressure in heart or blood vessels
2	A61B 5/1455: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring characteristics of blood in vivo -> using optical sensors
2	A61B 7/04: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Instruments for auscultation -> Stethoscopes -> Electric stethoscopes
2	A61K 39/12: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing antigens or antibodies -> Viral antigens
2	C07K 14/005: Chemistry; Metallurgy -> Organic Chemistry -> Peptides -> Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof -> from viruses
2	C07K 16/10: Chemistry; Metallurgy -> Organic Chemistry -> Peptides -> Immunoglobulins -> against material from viruses -> from RNA viruses
2	G01N 21/65: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which the material investigated is excited whereby it emits light or causes a change in wavelength of the incident light -> optically excited -> Raman scattering
2	G01N 33/497: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Physical analysis of biological material -> of gaseous biological material
2	G01N 33/68: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Chemical analysis of biological material -> involving proteins, peptides or amino acids

2	G06F 3/01: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit -> Input arrangements or combined input and output arrangements for interaction between user and computer
2	G06K-009/32
2	G06N 3/00: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on biological models
2	G06Q 10/06: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Administration; Management -> Resources, workflows, human or project management
2	G06Q 40/00: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Finance; Insurance; Tax strategies; Processing of corporate or income taxes
2	G06T 5/00: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image enhancement or restoration
2	G06V 10/764: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> using pattern recognition or machine learning -> using classification
2	G06V 10/774: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> using pattern recognition or machine learning -> Processing image or video features in feature spaces; using data integration or data reduction -> Generating sets of training patterns; Bootstrap methods
2	G06V 10/82: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> using pattern recognition or machine learning -> using neural networks
2	G06V 40/16: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Recognition of biometric, human-related or animal-related patterns in image or video data -> Human or animal bodies -> Human faces
2	G06V 40/18: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Recognition of biometric, human-related or animal-related patterns in image or video data -> Human or animal bodies -> Eye characteristics

2	G08B 21/18: Physics -> Signalling -> Signalling Or Calling Systems; Order Telegraphs; Alarm Systems -> Alarms responsive to a single specified undesired or abnormal condition and not otherwise provided for -> Status alarms
2	G10L 25/30: Physics -> Musical Instruments; Acoustics -> Speech Analysis Or Synthesis; Speech Recognition; Speech Or Voice Processing; Speech Or Audio Coding Or Decoding -> Speech or voice analysis techniques not restricted to a single one of groups G10L0015000000-G10L0021000000 -> characterised by the analysis technique -> using neural networks
2	G16B 40/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for biostatistics; ICT specially adapted for bioinformatics-related machine learning or data mining -> Supervised data analysis
2	G16H 15/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical reports
2	G16H 50/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics
2	G16H 70/60: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of medical references -> relating to pathologies
2	H04L-012/58
2	H04N 5/225: Electricity -> Electric Communication Technique -> Pictorial Communication -> Details of television systems -> Studio circuitry; Studio devices; Studio equipment -> Television cameras
2	H04W 4/021: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services making use of location information -> Services related to particular areas
2	H04W 4/02: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services making use of location information
2	H04W 4/18: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Information format or content conversion
1	A01N 37/02: Human Necessities -> Agriculture; Forestry; Animal Husbandry; Hunting; Trapping; Fishing -> Preservation Of Bodies Of Humans Or Animals Or Plants Or Parts Thereof; Biocides -> Biocides, pest repellants or attractants, or plant growth regulators containing organic compounds containing a carbon atom having three bonds to hetero atoms with at the most two bonds to halogen -> Saturated carboxylic acids or thio-analogues thereof; Derivatives thereof

1	A23K 20/158: Human Necessities -> Foods Or Foodstuffs; Treatment Thereof, Not Covered By Other Classes -> Feeding-Stuffs Specially Adapted For Animals; Methods Specially Adapted For Production Thereof -> Accessory food factors for animal feeding-stuffs -> Organic substances -> Fatty acids; Fats; Products containing oils or fats
1	A23L 33/105: Human Necessities -> Foods Or Foodstuffs; Treatment Thereof, Not Covered By Other Classes -> Foods, Foodstuffs, Or Non-Alcoholic Beverages, Not Covered By Subclasses A21d Or A23b-A23j; Their Preparation Or Treatment -> Modifying nutritive qualities of foods; Dietetic products; Preparation or treatment thereof -> using additives -> Plant extracts, their artificial duplicates or their derivatives
1	A61B 10/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Other methods or instruments for diagnosis
1	A61B 17/34: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Surgical instruments, devices or methods -> Trocars; Puncturing needles
1	A61B 3/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Apparatus for testing the eyes; Instruments for examining the eyes
1	A61B 3/12: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Apparatus for testing the eyes; Instruments for examining the eyes -> Objective types -> for looking at the eye fundus
1	A61B 5/02: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring pulse, heart rate, blood pressure or blood flow; Combined pulse/heart-rate/blood pressure determination; Evaluating a cardiovascular condition not otherwise provided for
1	A61B 5/097: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring devices for evaluating the respiratory organs -> Devices for facilitating collection of breath or for directing breath into or through measuring devices
1	A61B 5/103: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Measuring for diagnostic purposes; Identification of persons -> Measuring devices for testing the shape, pattern, size or movement of the body or parts thereof, for diagnostic purposes
1	A61B 6/02: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Apparatus for radiation diagnosis -> Devices for diagnosis sequentially in different planes; Stereoscopic radiation diagnosis
1	A61B 7/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Instruments for auscultation
1	A61B 7/02: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Instruments for auscultation -> Stethoscopes

1	A61B 8/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Diagnosis; Surgery; Identification -> Diagnosis using ultrasonic, sonic or infrasonic waves
1	A61B-000/00
1	A61J 1/03: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Containers Specially Adapted For Medical Or Pharmaceutical Purposes; Devices Or Methods Specially Adapted For Bringing Pharmaceutical Products Into Particular Physical Or Administering Forms; Devices For Administering Food Or Medicines Orally; Baby Comforters; Devices For Receiving Spittle -> Containers specially adapted for medical or pharmaceutical purposes -> for pills or tablets
1	A61J 7/04: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Containers Specially Adapted For Medical Or Pharmaceutical Purposes; Devices Or Methods Specially Adapted For Bringing Pharmaceutical Products Into Particular Physical Or Administering Forms; Devices For Administering Food Or Medicines Orally; Baby Comforters; Devices For Receiving Spittle -> Devices for administering medicines orally -> Arrangements for time indication or reminder for taking medicine
1	A61K 31/19: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Acids; Anhydrides, halides or salts thereof -> Carboxylic acids
1	A61K 31/375: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Heterocyclic Compounds -> having oxygen as the only ring hetero atom -> Lactones -> Ascorbic acid
1	A61K 31/427: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Heterocyclic Compounds -> having nitrogen as a ring hetero atom -> having five-membered rings with two or more ring hetero atoms, at least one of which is nitrogen -> Thiazoles -> not condensed and containing further heterocyclic rings
1	A61K 31/513: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Heterocyclic Compounds -> having nitrogen as a ring hetero atom -> having six-membered rings with two nitrogen atoms as the only ring hetero atoms -> Pyrimidines; Hydrogenated pyrimidines -> having oxo groups directly attached to the heterocyclic ring

1	A61K 31/522: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Heterocyclic Compounds -> having nitrogen as a ring hetero atom -> having six-membered rings with two nitrogen atoms as the only ring hetero atoms -> Pyrimidines; Hydrogenated pyrimidines -> ortho- or peri-condensed with heterocyclic rings -> Purines -> having oxo groups directly attached to the heterocyclic ring
1	A61K 31/546: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Heterocyclic Compounds -> having nitrogen as a ring hetero atom -> having six-membered rings with at least one nitrogen and at least one sulfur as the ring hetero atoms -> ortho- or peri-condensed with heterocyclic ring systems -> Compounds containing 5-thia-1-azabicyclo [4.2.0] octane ring systems -> containing further heterocyclic rings
1	A61K 31/65: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing organic active ingredients -> Tetracyclines
1	A61K 45/06: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations containing active ingredients not provided for in groups A61K0031000000-A61K0041000000 -> Mixtures of active ingredients without chemical characterisation
1	A61K 9/48: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Preparations For Medical, Dental, Or Toilet Purposes -> Medicinal preparations characterised by special physical form -> Preparations in capsules
1	A61L 11/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Methods Or Apparatus For Sterilising Materials Or Objects In General; Disinfection, Sterilisation, Or Deodorisation Of Air; Chemical Aspects Of Bandages, Dressings, Absorbent Pads, Or Surgical Articles; Materials For Bandages, Dressings, Absorbent Pads, Or Surgical Articles -> Disinfection or sterilising methods specially adapted for refuse
1	A61L 2/10: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Methods Or Apparatus For Sterilising Materials Or Objects In General; Disinfection, Sterilisation, Or Deodorisation Of Air; Chemical Aspects Of Bandages, Dressings, Absorbent Pads, Or Surgical Articles; Materials For Bandages, Dressings, Absorbent Pads, Or Surgical Articles -> Methods or apparatus for disinfecting or sterilising materials or objects other than foodstuffs or contact lenses; Accessories therefor -> using physical phenomena -> Radiation -> Ultra-violet radiation

1	A61L 2/18: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Methods Or Apparatus For Sterilising Materials Or Objects In General; Disinfection, Sterilisation, Or Deodorisation Of Air; Chemical Aspects Of Bandages, Dressings, Absorbent Pads, Or Surgical Articles; Materials For Bandages, Dressings, Absorbent Pads, Or Surgical Articles -> Methods or apparatus for disinfecting or sterilising materials or objects other than foodstuffs or contact lenses; Accessories therefor -> using chemical substances -> Liquid substances
1	A61L 27/54: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Methods Or Apparatus For Sterilising Materials Or Objects In General; Disinfection, Sterilisation, Or Deodorisation Of Air; Chemical Aspects Of Bandages, Dressings, Absorbent Pads, Or Surgical Articles; Materials For Bandages, Dressings, Absorbent Pads, Or Surgical Articles -> Materials for prostheses or for coating prostheses -> Materials characterised by their function or physical properties -> Biologically active materials
1	A61M 11/04: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Devices For Introducing Media Into, Or Onto, The Body; Devices For Transducing Body Media Or For Taking Media From The Body; Devices For Producing Or Ending Sleep Or Stupor -> Sprayers or atomisers specially adapted for therapeutic purposes -> operated by the vapour pressure of the liquid to be sprayed or atomised
1	A61M 15/00: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Devices For Introducing Media Into, Or Onto, The Body; Devices For Transducing Body Media Or For Taking Media From The Body; Devices For Producing Or Ending Sleep Or Stupor -> Inhalators
1	A61P 13/12: Human Necessities -> Medical Or Veterinary Science; Hygiene -> Specific Therapeutic Activity Of Chemical Compounds Or Medicinal Preparations -> Drugs for disorders of the urinary system -> of the kidneys
1	A63B 21/00: Human Necessities -> Sports; Games; Amusements -> Apparatus For Physical Training, Gymnastics, Swimming, Climbing, Or Fencing; Ball Games; Training Equipment -> Exercising apparatus for developing or strengthening the muscles or joints of the body by working against a counterforce, with or without measuring devices
1	A63B 23/12: Human Necessities -> Sports; Games; Amusements -> Apparatus For Physical Training, Gymnastics, Swimming, Climbing, Or Fencing; Ball Games; Training Equipment -> Exercising apparatus specially adapted for particular parts of the body -> for limbs -> for upper limbs
1	A63F 13/67: Human Necessities -> Sports; Games; Amusements -> Card, Board Or Roulette Games; Indoor Games Using Small Moving Playing Bodies; Video Games; Games Not Otherwise Provided For -> Video games -> Generating or modifying game content before or while executing the game program -> adaptively or by learning from player actions

1	B60T 8/88: Performing Operations; Transporting -> Vehicles In General -> Vehicle Brake Control Systems Or Parts Thereof; Brake Control Systems Or Parts Thereof, In General; Arrangement Of Braking Elements On Vehicles In General; Portable Devices For Preventing Unwanted Movement Of Vehicles; Vehicle Modifications To Facilitate Cooling Of Brakes -> Arrangements for adjusting wheel-braking force to meet varying vehicular or ground-surface conditions -> responsive to a speed condition -> with failure responsive means
1	B64G 1/10: Performing Operations; Transporting -> Aircraft; Aviation; Cosmonautics -> Cosmonautics; Vehicles Or Equipment Therefor -> Cosmonautic vehicles -> Artificial satellites; Systems of such satellites; Interplanetary vehicles
1	B82Y 5/00: Performing Operations; Transporting -> Nanotechnology -> Specific Uses Or Applications Of Nanostructures; Measurement Or Analysis Of Nanostructures; Manufacture Or Treatment Of Nanostructures -> Nanobiotechnology or nanomedicine
1	C02F 1/44: Chemistry; Metallurgy -> Treatment Of Water, Waste Water, Sewage, Or Sludge -> Treatment Of Water, Waste Water, Sewage, Or Sludge -> Treatment of water, waste water, or sewage -> by dialysis, osmosis or reverse osmosis
1	C07D 213/61: Chemistry; Metallurgy -> Organic Chemistry -> Heterocyclic Compounds -> Heterocyclic compounds containing six-membered rings, not condensed with other rings, with one nitrogen atom as the only ring hetero atom and three or more double bonds between ring members or between ring members and non-ring members -> having three double bonds between ring members or between ring members and non-ring members -> having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen or carbon atoms directly attached to the ring nitrogen atom -> with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen -> Halogen atoms or nitro radicals
1	C07K 1/00: Chemistry; Metallurgy -> Organic Chemistry -> Peptides -> General processes for the preparation of peptides
1	C07K 14/435: Chemistry; Metallurgy -> Organic Chemistry -> Peptides -> Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof -> from animals; from humans
1	C12N 15/113: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Microorganisms Or Enzymes; Compositions Thereof; Propagating, Preserving, Or Maintaining Microorganisms; Mutation Or Genetic Engineering; Culture Media -> Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors -> Recombinant DNA-technology -> DNA or RNA fragments; Modified forms thereof -> Non-coding nucleic acids modulating the expression of genes

1	<p>C12N 15/11: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Microorganisms Or Enzymes; Compositions Thereof; Propagating, Preserving, Or Maintaining Microorganisms; Mutation Or Genetic Engineering; Culture Media -> Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors -> Recombinant DNA-technology -> DNA or RNA fragments; Modified forms thereof</p>
1	<p>C12Q 1/6876: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Measuring Or Testing Processes Involving Enzymes, Nucleic Acids Or Microorganisms; Compositions Or Test Papers Therefor; Processes Of Preparing Such Compositions; Condition-Responsive Control In Microbiological Or Enzymological Processes -> Measuring or testing processes involving enzymes, nucleic acids or microorganisms; Compositions therefor; Processes of preparing such compositions -> involving nucleic acids -> Nucleic acid products used in the analysis of nucleic acids</p>
1	<p>C12Q 1/6883: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Measuring Or Testing Processes Involving Enzymes, Nucleic Acids Or Microorganisms; Compositions Or Test Papers Therefor; Processes Of Preparing Such Compositions; Condition-Responsive Control In Microbiological Or Enzymological Processes -> Measuring or testing processes involving enzymes, nucleic acids or microorganisms; Compositions therefor; Processes of preparing such compositions -> involving nucleic acids -> Nucleic acid products used in the analysis of nucleic acids -> for diseases caused by alterations of genetic material</p>
1	<p>C12Q 1/68: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Measuring Or Testing Processes Involving Enzymes, Nucleic Acids Or Microorganisms; Compositions Or Test Papers Therefor; Processes Of Preparing Such Compositions; Condition-Responsive Control In Microbiological Or Enzymological Processes -> Measuring or testing processes involving enzymes, nucleic acids or microorganisms; Compositions therefor; Processes of preparing such compositions -> involving nucleic acids</p>
1	<p>C12Q 1/70: Chemistry; Metallurgy -> Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation Or Genetic Engineering -> Measuring Or Testing Processes Involving Enzymes, Nucleic Acids Or Microorganisms; Compositions Or Test Papers Therefor; Processes Of Preparing Such Compositions; Condition-Responsive Control In Microbiological Or Enzymological Processes -> Measuring or testing processes involving enzymes, nucleic acids or microorganisms; Compositions therefor; Processes of preparing such compositions -> involving virus or bacteriophage</p>

1	C22C 38/38: Chemistry; Metallurgy -> Metallurgy; Ferrous Or Non-Ferrous Alloys; Treatment Of Alloys Or Non-Ferrous Metals -> Alloys -> Ferrous alloys -> containing chromium -> with more than 1.5% by weight of manganese
1	E05B 47/00: Fixed Constructions -> Locks; Keys; Window Or Door Fittings; Safes -> Locks; Accessories Therefor; Handcuffs -> Operating or controlling locks or other fastening devices by electric or magnetic means
1	G01C 19/00: Physics -> Measuring; Testing -> Measuring Distances, Levels Or Bearings; Surveying; Navigation; Gyroscopic Instruments; Photogrammetry Or Videogrammetry -> Gyroscopes; Turn-sensitive devices using vibrating masses; Turn-sensitive devices without moving masses; Measuring angular rate using gyroscopic effects
1	G01N 21/33: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which incident light is modified in accordance with the properties of the material investigated -> Colour; Spectral properties -> Investigating relative effect of material at wavelengths characteristic of specific elements or molecules -> using ultra-violet light
1	G01N 21/3563: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which incident light is modified in accordance with the properties of the material investigated -> Colour; Spectral properties -> Investigating relative effect of material at wavelengths characteristic of specific elements or molecules -> using infra-red light -> for analysing solids; Preparation of samples therefor
1	G01N 21/3577: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which incident light is modified in accordance with the properties of the material investigated -> Colour; Spectral properties -> Investigating relative effect of material at wavelengths characteristic of specific elements or molecules -> using infra-red light -> for analysing liquids
1	G01N 21/64: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems in which the material investigated is excited whereby it emits light or causes a change in wavelength of the incident light -> optically excited -> Fluorescence; Phosphorescence
1	G01N 21/88: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of optical means -> Systems specially adapted for particular applications -> Investigating the presence of flaws, defects or contamination

1	G01N 23/04: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of wave or particle radiation -> by transmitting the radiation through the material -> and forming images of the material
1	G01N 27/30: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by the use of electric, electrochemical, or magnetic means -> by investigating electrochemical variables; by using electrolysis or electrophoresis -> Electrolytic cell components -> Electrodes
1	G01N 33/00: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000
1	G01N 33/483: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Physical analysis of biological material
1	G01N 33/53: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Chemical analysis of biological material -> Immunoassay; Biospecific binding assay; Materials therefor
1	G01N 33/569: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Chemical analysis of biological material -> Immunoassay; Biospecific binding assay; Materials therefor -> for microorganisms
1	G01N 33/84: Physics -> Measuring; Testing -> Investigating Or Analysing Materials By Determining Their Chemical Or Physical Properties -> Investigating or analysing materials by specific methods not covered by groups G01N0001000000-G01N0031000000 -> Biological material -> Chemical analysis of biological material -> involving inorganic compounds or pH
1	G01R 29/08: Physics -> Measuring; Testing -> Measuring Electric Variables; Measuring Magnetic Variables -> Arrangements for measuring or indicating electric quantities not covered by groups G01R0019000000-G01R0027000000 -> Measuring electromagnetic field characteristics
1	G01R 31/00: Physics -> Measuring; Testing -> Measuring Electric Variables; Measuring Magnetic Variables -> Arrangements for testing electric properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere

1	G01R 31/3835: Physics -> Measuring; Testing -> Measuring Electric Variables; Measuring Magnetic Variables -> Arrangements for testing electric properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere -> Arrangements for testing, measuring or monitoring the electrical condition of accumulators or electric batteries -> Arrangements for monitoring battery or accumulator variables -> involving only voltage measurements
1	G01S 17/89: Physics -> Measuring; Testing -> Radio Direction-Finding; Radio Navigation; Determining Distance Or Velocity By Use Of Radio Waves; Locating Or Presence-Detecting By Use Of The Reflection Or Reradiation Of Radio Waves; Analogous Arrangements Using Other Waves -> Systems using the reflection or reradiation of electromagnetic waves other than radio waves -> Lidar systems, specially adapted for specific applications -> for mapping or imaging
1	G01V 8/10: Physics -> Measuring; Testing -> Geophysics; Gravitational Measurements; Detecting Masses Or Objects; Tags -> Prospecting or detecting by optical means -> Detecting
1	G05B 19/042: Physics -> Controlling; Regulating -> Control Or Regulating Systems In General; Functional Elements Of Such Systems; Monitoring Or Testing Arrangements For Such Systems Or Elements -> Programme-control systems -> electric -> Programme control other than numerical control -> using digital processors
1	G05D 1/00: Physics -> Controlling; Regulating -> Systems For Controlling Or Regulating Non-Electric Variables -> Control of position, course, altitude, or attitude of land, water, air, or space vehicles
1	G06F 16/2455: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Information retrieval; Database structures therefor; File system structures therefor -> of structured data -> Querying -> Query processing -> Query execution
1	G06F 16/36: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Information retrieval; Database structures therefor; File system structures therefor -> of unstructured textual data -> Creation of semantic tools
1	G06F 16/955: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Information retrieval; Database structures therefor; File system structures therefor -> Details of database functions independent of the retrieved data types -> Retrieval from the web -> using information identifiers
1	G06F 17/15: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Digital computing or data processing equipment or methods, specially adapted for specific functions -> Complex mathematical operations -> Correlation function computation
1	G06F 17/18: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Digital computing or data processing equipment or methods, specially adapted for specific functions -> Complex mathematical operations -> for evaluating statistical data

1	G06F 21/50: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity -> Monitoring users, programs or devices to maintain the integrity of platforms
1	G06F 21/56: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity -> Monitoring users, programs or devices to maintain the integrity of platforms -> Detecting local intrusion or implementing counter-measures -> Computer malware detection or handling
1	G06F 3/0346: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit -> Input arrangements or combined input and output arrangements for interaction between user and computer -> Arrangements for converting the position or the displacement of a member into a coded form -> Pointing devices displaced or positioned by the user; Accessories therefor -> with detection of the device orientation or free movement in a 3D space
1	G06F 3/0354: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit -> Input arrangements or combined input and output arrangements for interaction between user and computer -> Arrangements for converting the position or the displacement of a member into a coded form -> Pointing devices displaced or positioned by the user; Accessories therefor -> with detection of 2D relative movements between the device, or an operating part thereof, and a plane or surface
1	G06F 3/03: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit -> Input arrangements or combined input and output arrangements for interaction between user and computer -> Arrangements for converting the position or the displacement of a member into a coded form
1	G06F 30/34: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Computer-aided design [CAD] -> Circuit design -> for reconfigurable circuits
1	G06F 40/20: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Handling natural language data -> Natural language analysis
1	G06F 40/253: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Handling natural language data -> Natural language analysis -> Grammatical analysis; Style critique
1	G06F 40/279: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Handling natural language data -> Natural language analysis -> Recognition of textual entities

1	G06F 8/71: Physics -> Computing; Calculating Or Counting -> Electric Digital Data Processing -> Arrangements for software engineering -> Software maintenance or management -> Version control; Configuration management
1	G06K-009/20
1	G06N 3/063: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on biological models -> using neural network models -> Physical realisation -> using electronic means
1	G06N 7/02: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Computing arrangements based on specific mathematical models -> using fuzzy logic
1	G06N 99/00: Physics -> Computing; Calculating Or Counting -> Computing Arrangements Based On Specific Computational Models -> Subject matter not provided for in other groups of this subclass
1	G06Q 10/04: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Administration; Management -> Forecasting or optimisation
1	G06Q 10/08: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Administration; Management -> Logistics
1	G06Q 30/08: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Commerce -> Buying, selling or leasing transactions -> Auctions
1	G06Q 40/06: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Finance; Insurance; Tax strategies; Processing of corporate or income taxes -> Investment
1	G06Q 50/18: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for specific business sectors -> Services -> Legal services; Handling legal documents

1	G06Q 50/20: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for specific business sectors -> Services -> Education
1	G06Q 90/00: Physics -> Computing; Calculating Or Counting -> Data Processing Systems Or Methods, Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes; Systems Or Methods Specially Adapted For Administrative, Commercial, Financial, Managerial, Supervisory Or Forecasting Purposes, Not Otherwise Provided For -> Systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not involving significant data processing
1	G06T 1/60: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> General purpose image data processing -> Memory management
1	G06T 11/00: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> 2D [Two Dimensional] image generation
1	G06T 5/30: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image enhancement or restoration -> by the use of local operators -> Erosion or dilatation
1	G06T 7/143: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Segmentation; Edge detection -> involving probabilistic approaches
1	G06T 7/174: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Segmentation; Edge detection -> involving the use of two or more images
1	G06T 7/187: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Segmentation; Edge detection -> involving region growing; involving region merging; involving connected component labelling
1	G06T 7/33: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Determination of transform parameters for the alignment of images -> using feature-based methods
1	G06T 7/40: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Analysis of texture
1	G06T 7/55: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Depth or shape recovery -> from multiple images
1	G06T 7/90: Physics -> Computing; Calculating Or Counting -> Image Data Processing Or Generation, In General -> Image analysis -> Determination of colour characteristics

1	G06V 10/20: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> Image preprocessing
1	G06V 10/32: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> Image preprocessing -> Normalisation of the pattern dimensions
1	G06V 10/77: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Arrangements for image or video recognition or understanding -> using pattern recognition or machine learning -> Processing image or video features in feature spaces; using data integration or data reduction
1	G06V 20/69: Physics -> Computing; Calculating Or Counting -> Image Or Video Recognition Or Understanding -> Scenes; Scene-specific elements -> Type of objects -> Microscopic objects
1	G07C 9/00: Physics -> Checking-Devices -> Time Or Attendance Registers; Registering Or Indicating The Working Of Machines; Generating Random Numbers; Voting Or Lottery Apparatus; Arrangements, Systems Or Apparatus For Checking Not Provided For Elsewhere -> Individual registration on entry or exit
1	G07C 9/37: Physics -> Checking-Devices -> Time Or Attendance Registers; Registering Or Indicating The Working Of Machines; Generating Random Numbers; Voting Or Lottery Apparatus; Arrangements, Systems Or Apparatus For Checking Not Provided For Elsewhere -> Individual registration on entry or exit -> not involving the use of a pass -> in combination with an identity check -> using biometric data
1	G07C 9/38: Physics -> Checking-Devices -> Time Or Attendance Registers; Registering Or Indicating The Working Of Machines; Generating Random Numbers; Voting Or Lottery Apparatus; Arrangements, Systems Or Apparatus For Checking Not Provided For Elsewhere -> Individual registration on entry or exit -> not involving the use of a pass -> with central registration
1	G08B 13/191: Physics -> Signalling -> Signalling Or Calling Systems; Order Telegraphs; Alarm Systems -> Burglar, theft or intruder alarms -> Actuation by interference with heat, light, or radiation of shorter wavelength; Actuation by intruding sources of heat, light, or radiation of shorter wavelength -> using passive radiation detection systems -> using infra-red-radiation detection systems -> using pyroelectric sensor means
1	G08B 27/00: Physics -> Signalling -> Signalling Or Calling Systems; Order Telegraphs; Alarm Systems -> Alarm systems in which the alarm condition is signalled from a central station to a plurality of substations
1	G08B 31/00: Physics -> Signalling -> Signalling Or Calling Systems; Order Telegraphs; Alarm Systems -> Predictive alarm systems characterised by extrapolation or other computation using updated historic data
1	G10L 17/26: Physics -> Musical Instruments; Acoustics -> Speech Analysis Or Synthesis; Speech Recognition; Speech Or Voice Processing; Speech Or Audio Coding Or Decoding -> Speaker identification or verification -> Recognition of special voice characteristics

1	G10L 25/18: Physics -> Musical Instruments; Acoustics -> Speech Analysis Or Synthesis; Speech Recognition; Speech Or Voice Processing; Speech Or Audio Coding Or Decoding -> Speech or voice analysis techniques not restricted to a single one of groups G10L0015000000-G10L0021000000 -> characterised by the type of extracted parameters -> the extracted parameters being spectral information of each sub-band
1	G10L 25/66: Physics -> Musical Instruments; Acoustics -> Speech Analysis Or Synthesis; Speech Recognition; Speech Or Voice Processing; Speech Or Audio Coding Or Decoding -> Speech or voice analysis techniques not restricted to a single one of groups G10L0015000000-G10L0021000000 -> specially adapted for particular use -> for comparison or discrimination -> for extracting parameters related to health condition
1	G16B 15/30: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for analysing two-dimensional or three-dimensional molecular structures -> Drug targeting using structural data; Docking or binding prediction
1	G16B 20/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for functional genomics or proteomics
1	G16B 30/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for sequence analysis involving nucleotides or amino acids
1	G16B 40/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for biostatistics; ICT specially adapted for bioinformatics-related machine learning or data mining
1	G16B 5/20: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT specially adapted for modelling or simulations in systems biology -> Probabilistic models
1	G16B 50/30: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Bioinformatics -> ICT programming tools or database systems specially adapted for bioinformatics -> Data warehousing; Computing architectures
1	G16H 10/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of patient-related medical or healthcare data
1	G16H 10/40: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the handling or processing of patient-related medical or healthcare data -> for data related to laboratory analysis
1	G16H 20/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for therapies or health-improving plans

1	G16H 40/63: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices -> for the operation of medical equipment or devices -> for local operation
1	G16H 80/00: Physics -> Information And Communication Technology [Ict] Specially Adapted For Specific Application Fields -> Healthcare Informatics -> ICT specially adapted for facilitating communication between medical practitioners or patients
1	G99Z 99/00: Physics -> Subject Matter Not Otherwise Provided For In This Section -> Subject Matter Not Otherwise Provided For In This Section -> Subject Matter Not Otherwise Provided For In This Section
1	H01L 27/12: Electricity -> Basic Electric Elements -> Semiconductor Devices; Electric Solid State Devices Not Otherwise Provided For -> Devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate -> including semiconductor components specially adapted for rectifying, oscillating, amplifying or switching and having at least one potential-jump barrier or surface barrier; including integrated passive circuit elements with at least one potential-jump barrier or surface barrier -> the substrate being other than a semiconductor body
1	H04B 17/318: Electricity -> Electric Communication Technique -> Transmission -> Monitoring; Testing -> of propagation channels -> Measuring or estimating channel quality parameters -> Received signal strength
1	H04L 67/10: Electricity -> Electric Communication Technique -> Transmission Of Digital Information -> Network arrangements or protocols for supporting network services or applications -> Protocols -> in which an application is distributed across nodes in the network
1	H04L-012/861
1	H04L-029/06
1	H04M 1/21: Electricity -> Electric Communication Technique -> Telephonic Communication -> Substation equipment -> Constructional features of telephone sets -> Combinations with auxiliary equipment
1	H04N 1/00: Electricity -> Electric Communication Technique -> Pictorial Communication -> Scanning, transmission or reproduction of documents or the like
1	H04N 19/587: Electricity -> Electric Communication Technique -> Pictorial Communication -> Methods or arrangements for coding, decoding, compressing or decompressing digital video signals -> using predictive coding -> involving temporal sub-sampling or interpolation
1	H04N 21/442: Electricity -> Electric Communication Technique -> Pictorial Communication -> Selective content distribution -> Client devices specifically adapted for the reception of, or interaction with, content -> Processing of content or additional data -> Monitoring of processes or resources

1	H04N 9/68: Electricity -> Electric Communication Technique -> Pictorial Communication -> Details of colour television systems -> Circuits for processing colour signals -> for controlling the amplitude of colour signals
1	H04W 4/70: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services for machine-to-machine communication [M2M] or machine type communication [MTC]
1	H04W 4/90: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Services specially adapted for wireless communication networks; Facilities therefor -> Services for handling of emergency or hazardous situations
1	H04W 84/04: Electricity -> Electric Communication Technique -> Wireless Communication Networks -> Network topologies -> Hierarchically pre-organised networks -> Large scale networks; Deep hierarchical networks

4. Network metrics

Node	Algorithm/ Application field	Degree	Weighted Degree	Eigenvector centrality	Closeness centrality	Betweenness centrality
Diagnosis	Application Field	20	354	0.830	0.800	0.111
CNN	Algorithm	20	286	0.879	0.800	0.047
Prevention	Application Field	15	122	0.662	0.686	0.020
SVM	Algorithm	24	222	1.000	0.923	0.102
RF	Algorithm	20	162	0.907	0.800	0.032
DT	Algorithm	22	150	0.945	0.857	0.096
Logistic Regression	Algorithm	21	130	0.900	0.828	0.061
Monitoring	Application Field	8	38	0.367	0.558	0.000
Prognosis	Application Field	8	38	0.314	0.558	0.012
ANN	Algorithm	17	78	0.774	0.727	0.026
Naive Bayes	Algorithm	16	74	0.722	0.706	0.018
K-means	Algorithm	14	64	0.639	0.667	0.029
K-NN	Algorithm	14	58	0.671	0.667	0.006
Linear Regression	Algorithm	14	54	0.646	0.667	0.011
MLP	Algorithm	13	44	0.641	0.649	0.003
Chatbot	Algorithm	6	24	0.245	0.533	0.000
FCN	Algorithm	4	14	0.084	0.462	0.000
PCA	Algorithm	12	38	0.585	0.632	0.002
RNN	Algorithm	9	28	0.426	0.585	0.000
Forecast	Application Field	14	60	0.662	0.649	0.005
NLP	Algorithm	13	40	0.569	0.632	0.009
DNN	Algorithm	12	40	0.548	0.615	0.003
Other	Application Field	9	44	0.415	0.571	0.002
Treatment	Application Field	9	30	0.401	0.571	0.001
Management	Application Field	4	8	0.115	0.480	0.000

IPC code	Degree	Weighted degree	Eigenvector centrality	Closeness centrality	Betweenness centrality
G16H-050/20	26	310	0.995375207	0.90625	0.051133698
G06K-009/62	21	270	0.842526544	0.7837838	0.036958075

G06N-020/00	27	246	1	0.9354839	0.076175726
G06N-003/08	24	234	0.952438999	0.8529412	0.033943943
G06N-003/04	23	212	0.935954196	0.8285714	0.025135592
G06T-007/00	23	206	0.930330399	0.8285714	0.02826639
A61B-005/00	25	186	0.965292768	0.8787879	0.053267368
G16H-050/80	22	164	0.897342884	0.8055556	0.02422643
G16H-050/70	17	142	0.71121888	0.7073171	0.011366746
G16H-010/60	18	106	0.71239201	0.725	0.021119001
A61B-006/03	14	106	0.653604154	0.6590909	6.34E-04
A61B-006/00	16	102	0.714154994	0.6904762	0.004984219
G06K-009/00	19	90	0.765952096	0.7435897	0.027182895
G06T-007/11	16	80	0.709809908	0.6904762	0.004904161
G16H-050/30	15	76	0.628884121	0.6744186	0.009408476
G16H-030/40	16	68	0.705642893	0.6904762	0.004031074
G16H-030/20	12	58	0.554048736	0.6304348	0.001480942
A61B-005/08	16	56	0.712544315	0.6904762	0.005750236
G06N-003/02	13	54	0.601248414	0.6444444	0.001094691
G06Q-050/22	16	52	0.627991815	0.6904762	0.020260842
A61B-005/0205	17	46	0.701576442	0.7073171	0.016518279
A61B-005/024	12	38	0.482641432	0.6304348	0.008735223
G16H-050/50	10	36	0.470542361	0.6041667	0
A61B-005/01	11	30	0.472372546	0.6170213	0.003317482

G06N-007/00	9	28	0.429030742	0.5918367	0
G16H-040/20	8	26	0.33068363	0.58	0.001583392
G06Q-010/10	9	24	0.296149624	0.5918367	0.008213113
G06Q-050/00	7	20	0.244074867	0.5686275	0.003704355
A61K-039/00	7	18	0.306641401	0.5686275	0.002791461
H04L-029/08	5	12	0.196111887	0.5471698	0.001496492