

SAMPLE

Artificial Intelligence In Medical Diagnostics

Patent Landscape Analysis

August 2019

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- Health Discovery v. Equibits and Ciphergen Biosystems
- Kaniadakis v. Salesforce.com et al
- Dexcom v. Agamatrix
- Avery et al v. Barsky
- Healthways and Robert Bosch v. Alere
- LD Technology LLC v. Impeto Medical SAS et al
- Fitbit, Inc. v. AliphCom et al
- Siemens Med. Sol. USA => Cerner Health Services v. Humedica
- Alt v. Medtronic
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- Electroencephalography
- Electromyography
- Facial analysis
- Magnetic Resonance Imaging
- Minimally invasive imaging
- Movement analysis
- Optical Coherence Tomography (OCT) imaging
- Photoacoustic imaging
- Positron-Emitting Tomography (PET) scanners
- Speech analysis
- Ultrasound imaging
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- Allergies
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- Brain injuries & Neurodegenerative diseases
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We Know Technology, We Know Patents

INTRODUCTION

Scope of the Report

- This report provides a detailed picture of the patent landscape for **AI in medical diagnostics**.
- This report covers **patents published worldwide up to February 2019**.
- We have selected and analyzed more than **7,100 patent families** that are relevant to the scope of this report.

Included in the report

✓ Patents related to **AI in medical diagnostics**

✓ Including patents related to the diagnostic modalities such as:

- ✓ Biochemical tests
- ✓ Blood pressure
- ✓ Cardiopulmonary sounds
- ✓ Computed tomography (CT) scanners
- ✓ Elastography
- ✓ Electrocardiogram
- ✓ Electroencephalogram
- ✓ Electromyogram
- ✓ Facial analysis
- ✓ Magnetic Resonance Imaging
- ✓ Minimally invasive imaging
- ✓ Movement analysis
- ✓ Optical Coherence Tomography (OCT) imaging
- ✓ Photoacoustic imaging
- ✓ Positron-Emitting Tomography (PET) scanners
- ✓ Speech analysis
- ✓ Ultrasound imaging,
- ✓ X-rays

✓ Including patents related to clinical specialties such as:

- ✓ Anesthesia monitoring
- ✓ Arthropathology and Osteopathology
- ✓ Brain injuries & Neurodegenerative diseases
- ✓ Cardiovascular diseases
- ✓ Diabetes
- ✓ Gait analysis & Fall prediction
- ✓ Hepatology
- ✓ Irritable Bowel Syndrome
- ✓ Infectiology
- ✓ Maternal & Fetal monitoring
- ✓ Ophthalmology
- ✓ Pneumopathology
- ✓ Psychiatry & Psychology
- ✓ Sleep monitoring
- ✓ Stomatology
- ✓ Oncology (with specific focus on breast, colorectal, liver, lung, prostate and skin cancers)

Not included in the report

X Patents related to medical diagnostics that do not involve the use of AI

X Patents involving AI but exclusively for other purposes (e.g. computer diagnostics), including other medical purposes (e.g. for drug discovery).

INTRODUCTION

Key Features of the report

- The report provides **essential patent data** for **AI in Medical Diagnostics**.
- It provides **in-depth patent analyses** of **key technologies** and **key players** including:
 - Time evolution of patent publications and countries of patent filings.
 - Current legal status of patents.
 - Ranking of main patent applicants.
 - Joint developments and IP collaboration network of main patent applicants.
 - Key patents.
 - Relative strength of main companies IP portfolio.
 - Matrix patent applicants/technology issues for main IP players.
- The **IP profiles of 20 key players** is presented, including key patents, technological issues, partnerships, IP strength: Siemens, Philips, General Electric, Fujifilm, Samsung Electronics, IBM, Medtronic, Canon etc.



INTRODUCTION

Key Features of the report

- The report also provides an extensive **Excel database** with all patents analyzed in the report.
- This **patent database** allows multi-criteria searches, including:
 - Patent publication number
 - Hyperlinks to the original documents
 - Priority date
 - Title
 - Abstract
 - Patent assignees
 - Technical segmentation
 - Legal status for each member of the patent family
- This report **does not provide** any insight **analyses or counsel regarding legal aspects** or the validity of any individual patent. Knowmade is a research firm that provides technical analysis and technical opinions. Knowmade is not a law firm. The research, technical analysis and/or work proposed or provided by Knowmade and contained herein is not a legal opinion and should not be construed as such.



Patent assignees, IP dynamics, patent legal status, patent geographical coverage



Who has the best patent portfolio?

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Key patent families

Identification of the patent families with the higher impact

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KEY PATENT FAMILIES

Patent Citation Analysis (1/2)

This graph allow to identify main cited patent families by members have been published.

Granted: At least one family member is a **granted patent**.

Pending: At least one family member is a **pending patent**.

Lapsed: All family members are **lapsed** patents or patent a

Expired: At least one family member is an **expired patent**,

Revoked: At least one family member is a patent that has

KEY PATENT FAMILIES

Brain Power

Title	Systems, environment and methods for evaluation and management of autism spectrum disorder using a wearable data collection device		
Assignee(s)	Brain Power		
1st priority date:	2013-10-09	Publication number of a representative member of the family :	US 9,936,916
1st publication date:	2015-04-09		

Abstract:
The various systems and methods described in this patent family support anticipation and identification of adverse health events and/or atypical behavioral episodes such as Autistic behaviors, epileptic seizures, heart attack, stroke, and/or narcoleptic "sleep attacks" using a wearable data collection device. In another aspect, the systems, environment, and methods described herein support measurement of motions and vibrations associated with recurring transitory physiological states and events using a wearable data collection device.

Key figures:

Claim 1 (US 9,936,916):
1. A system comprising:
a portable data collection device designed to be held by a user or worn upon a body of the user, the data collection device comprising processing circuitry, and
a non-transitory computer readable medium having instructions stored thereon; and
one or more input capture elements connected to and/or in communication with the portable data collection device, wherein the one or more input capture elements are positioned upon or proximate to a head of the user or directed toward the head of the user;
wherein the instructions, when executed by the processing circuitry, cause the processing circuitry to:
collect, over a period of time via at least one of the one or more input capture elements, sensor data, wherein the sensor data includes at least one of image data, audio data, electromagnetic data, and motion data;
analyze the sensor data to identify a time progression of measurements including at least one of a plurality of involuntary small motion measurements, and b) a plurality of vibration measurements;
analyze the time progression of measurements to identify a physiological pattern, wherein the physiological pattern comprises at least one of a pronounced head motion pattern and a slow-wave change pattern, and the physiological pattern is based at least in part on at least one of a) the plurality of involuntary small motion measurements, and b) the plurality of vibration measurements;
analyze the physiological pattern to identify a physiological state indicated by the physiological pattern, and provide, to at least one of a user of the portable data collection device and a third party computing device, feedback corresponding to the physiological pattern, wherein providing feedback to the user comprises providing feedback responsive to the physiological state indicated by the physiological pattern, wherein the feedback comprises at least one of visual, audible, haptic, and neural stimulation feedback to the user, and the feedback is provided via at least one output feature of one or more output features of the portable data collection device, and providing feedback to the third party computing device comprises transmitting, via a wired or wireless transmission link, a data transmission to the third party computing device identifying at least one of the physiological pattern and an identification of a physiological state indicated by the physiological pattern.

In dependent claims it referred that one or more features of the user comprise at least one of a physiological disability, a sensory sensitivity, and a digestive disorder diagnosis (claim 3).

Legal status

Granted	US
Pending	AU, CA, EP, US

Family involved in a US Patent Infringement case?

NO

Received citation count

67

Number of citing assignees

63

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Main IP New comers & patent litigations

Identification of IP New comers & Short description of the cases

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MAIN PATENT LITIGATIONS IN THE U.S.

Patent infringement

Dexcom vs. **AgaMatrix**
One Step Ahead

Dexcom, Inc. v. Agamatrix, Inc.
Accused products: Blood glucose monitoring systems
US patents involved in lawsuit*: [9,724,045](#) and [9,750,460](#)
Date: from 2017-09-15 (court case stayed, appeal against the ITC decision in progress)
Courts:
• District Court for the **District of Delaware** (case number: 1:17-cv-01310)

and IPR2018-01716) both against patent US 9,724,045
and IPR2018-01718) both against patent US 9,750,460
the ITC decision

federal district court of Delaware. In its complaint the company alleged that
ts. These systems are marketed under the names:



AI in Medical Diagnostics – Patent Landscape Analysis | August 2019 | Ref. : KM19005
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PRESENTATION OF THE IP NEWCOMERS

Identification methodology

The IP newcomers are young players that recently entered the IP landscape about AI in medical diagnostics. If current IP newcomers are small companies, some of them startups, it is possible that some of them will one day become important players in this study's field. Having them identified allows to monitor their evolution and stay tuned for promising competitive intelligence.

In this study, the IP newcomers have been identified by isolating the companies which the first patent applications filed on the topic of AI in medical diagnostics were published in 2016 or later.

The analysis of the patent landscape shows numerous (over 90) IP newcomers working in the field of AI for medical diagnostics. This high number reflects how much artificial intelligence is expected to revolutionize healthcare and most particularly medical diagnostics.

One of the main difficulties in projects related to AI in medical diagnostics is the diversity of the competences required to develop an innovation. Some are software companies that are interested in finding healthcare applications for their algorithms while others are medical system makers willing to empower their solutions with the decision support capabilities provided by artificial intelligence.

Main IP newcomers origins

Another interesting fact about the IP newcomers is the diversity in their countries of origin. Indeed, even if a majority of them are headquartered in the US, there is an important number of Israeli companies among them and in a lesser extend, companies based in Canada, in the United-Kingdom, in China, in India or in Germany.

IP newcomers main topics

The IP newcomers are working on diverse topics. This being said 9 main topics have been isolated and the repartition of the IP newcomers in these topics is provided. The topic that is investigated by the more IP newcomers is the detection of cardiovascular diseases.



What are the key IP players for each segments?

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Segmentation domains: "medical exam" with "clinical specialties"

Here follows the list of the segments and examples illustrating their content:

- Clinical specialties

1. Allergies
2. Anesthesia monitoring
3. Arthropathology & Osteopathology (e.g. arthritis, osteoporosis)
4. Brain injuries & neurodegenerative diseases (e.g. cerebral concussion, Parkinson's and Alzheimer's diseases)
5. Cardiology & angiology (e.g. detection of thrombosis)
6. Diabetes diagnosis
7. Gait disorders & Fall prediction
8. Hepatology

1 – Biochemical tests

1st publication year	Number of patent families	Number of patent documents (approx.)
1980	0	0
1981	0	0
1982	0	0
1983	0	0
1984	0	0
1985	0	0
1986	0	0
1987	0	0
1988	0	0
1989	0	0
1990	1	1
1991	2	2
1992	3	3
1993	5	5
1994	8	8
1995	11	11
1996	17	17
1997	30	30
1998	29	34
1999	34	41
2000	32	58
2001	38	68
2002	46	82
2003	52	100
2004	69	120
2005	53	140
2006	60	160
2007	60	180
2008	58	200
2009	61	220
2010	77	250
2011	79	280
2012	60	300
2013	60	320
2014	47	350
2015	61	380
2016	77	420
2017	79	460
2018	79	500

[illegible]

Segmentation domains: "medical exam" with "clinical specialties"

[illegible]

Summary of this segment's key players

[illegible]

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Excel file with all patents analyzed in the report

Useful patent database allows multi-criteria searches

SAMPLE

		A		B		C		D		E		F		G		H		I		J		K		L		M		N		O		P		Q		R		S		T		U		V		W		X		Y		Z		AA		AB		AC		AD		AE		AF		AG		AH		AI		AJ		AK		AL		AM		AN		AO		AP		AQ		AR		AS		AT		AU		AV		AW		AX		AY		AZ		BA		BB		BC		BD		BE		BF		BG		BH		BI		BJ		BK		BL		BM		BN		BO		BP		BQ		BR		BS		BT		BU		BV		BW		BX		BY		BZ		CA		CB		CC		CD		CE		CF		CG		CH		CI		CJ		CK		CL		CM		CN		CO		CP		CQ		CR		CS		CT		CU		CV		CW		CX		CY		CZ		DA		DB		DC		DD		DE		DF		DG		DH		DI		DJ		DK		DL		DM		DN		DO		DP		DQ		DR		DS		DT		DU		DV		DW		DX		DY		DZ		EA		EB		EC		ED		EE		EF		EG		EH		EI		EJ		EK		EL		EM		EN		EO		EP		EQ		ER		ES		ET		EU		EV		EW		EX		EY		EZ		FA		FB		FC		FD		FE		FG		FH		FI		FJ		FK		FL		FM		FN		FO		FP		FQ		FR		FS		FT		FU		FV		FW		FX		FY		FZ		GA		GB		GC		GD		GE		GF		GG		GH		GI		GJ		GK		GL		GM		GN		GO		GP		GQ		GR		GS		GT		GU		GV		GW		GX		GY		GZ		HA		HB		HC		HD		HE		HF		HG		HH		HI		HJ		HK		HL		HM		HN		HO		HP		HQ		HR		HS		HT		HU		HV		HW		HX		HY		HZ		IA		IB		IC		ID		IE		IF		IG		IH		II		IJ		IK		IL		IM		IN		IO		IP		IQ		IR		IS		IT		IU		IV		IW		IX		IY		IZ		JA		JB		JC		JD		JE		JF		JG		JH		JI		JJ		JK		JL		JM		JN		JO		JP		JQ		JR		JS		JT		JU		JV		JW		JX		JY		JZ		KA		KB		KC		KD		KE		KF		KG		KH		KI		KJ		KK		KL		KM		KN		KO		KP		KQ		KR		KS		KT		KU		KV		KW		KX		KY		KZ		LA		LB		LC		LD		LE		LF		LG		LH		LI		LJ		LK		LM		LN		LO		LP		LQ		LR		LS		LT		LU		LV		LW		LX		LY		LZ		MA		MB		MC		MD		ME		MF		MG		MH		MI		MJ		MK		ML		MM		MN		MO		MP		MQ		MR		MS		MT		MU		MV		MW		MX		MY		MZ		NA		NB		NC		ND		NE		NF		NG		NH		NI		NJ		NK		NL		NM		NN		NO		NP		NQ		NR		NS		NT		NU		NV		NW		NX		NY		NZ		OA		OB		OC		OD		OE		OF		OG		OH		OI		OJ		OK		OL		OM		ON		OO		OP		OQ		OR		OS		OT		OU		OV		OW		OX		OY		OZ		PA		PB		PC		PD		PE		PF		PG		PH		PI		PJ		PK		PL		PM		PN		PO		PP		PQ		PR		PS		PT		PU		PV		PW		PX		PY		PZ		QA		QB		QC		QD		QE		QF		QG		QH		QI		QJ		QK		QL		QM		QN		QO		QP		QQ		QR		QS		QT		QU		QV		QW		QX		QY		QZ		RA		RB		RC		RD		RE		RF		RG		RH		RI		RJ		RK		RL		RM		RN		RO		RP		RQ		RR		RS		RT		RU		RV		RW		RX		RY		RZ		SA		SB		SC		SD		SE		SF		SG		SH		SI		SJ		SK		SL		SM		SN		SO		SP		SQ		SR		SS		ST		SU		SV		SW		SX		SY		SZ		TA		TB		TC		TD		TE		TF		TG		TH		TI		TJ		TK		TL		TM		TN		TO		TP		TQ		TR		TS		TT		TU		TV		TW		TX		TY		TZ		UA		UB		UC		UD		UE		UF		UG		UH		UI		UJ		UK		UL		UM		UN		UO		UP		UQ		UR		US		UT		UU		UV		UW		UX		UY		UZ		VA		VB		VC		VD		VE		VF		VG		VH		VI		VJ		VK		VL		VM		VN		VO		VP		VQ		VR		VS		VT		VU		VV		VW		VX		VY		VZ		WA		WB		WC		WD		WE		WF		WG		WH		WI		WJ		WK		WL		WM		WN		WO		WP		WQ		WR		WS		WT		WU		WV		WW		WX		WY		WZ		XA		XB		XC		XD		XE		XF		XG		XH		XI		XJ		XK		XL		XM		XN		XO		XP		XQ		XR		XS		XT		XU		XV		XW		XZ		YA		YB		YC		YD		YE		YF		YG		YH		YI		YJ		YK		YL		YM		YN		YO		YP		YQ		YR		YS		YT		YU		YV		YW		YZ		ZA		ZB		ZC		ZD		ZE		ZF		ZG		ZH		ZI		ZJ		ZK		ZL		ZM		ZN		ZO		ZP		ZQ		ZR		ZS		ZT		ZU		ZV		ZW		ZX		ZY		ZZ	
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ORDER FORM

Artificial Intelligence in Medical Diagnostics

Patent Landscape Analysis – August 2019

Ref.:KM19005

SHIP TO

Name (Mr/Ms/Dr/Pr):

Job Title:

Company:

Address:

City:

State:

Postcode/Zip:

Country:

VAT ID Number for EU members:

Tel:

Email:

Date:

PAYMENT METHODS

Check

To pay your invoice using a check, please mail your check to the following address:

KnowMade S.A.R.L.
2405 route des Dolines
06902 Valbonne Sophia Antipolis
FRANCE

Money Transfer

To pay your invoice using a bank money wire transfer please contact your bank to complete this process. Here is the information that you will need to submit the payment:

Payee: KnowMade S.A.R.L.
Bank: Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France
IBAN: FR76 1460 7003 6360 6214 5695 139
BIC/SWIFT: CCBPFRPPMAR

Paypal

In order to pay your invoice via PAYPAL, you must first register at www.paypal.com. Then you can send money to the KnowMade S.A.R.L. by entering our E-mail address contact@knowmade.fr as the recipient and entering the invoice amount.

RETURN ORDER BY

E-mail: contact@knowmade.fr

Mail: KnowMade S.A.R.L., 2405 route des Dolines, 06902 Valbonne Sophia Antipolis, FRANCE

PRODUCT ORDER

☐ €6,490 – Corporate license

☐ €5,990 – Single user license*

For price in dollars, please use the day's exchange rate. For French customer, add 20% for VAT.

All reports are delivered electronically in pdf format at payment reception.

**Single user license means only one person at the company can use the report. Please be aware that our publication will be watermarked on each page with the name of the recipient and of the organization (the name mentioned on the PO). This watermark will also mention that the report sharing is not allowed.*



I hereby accept Knowmade's Terms and Conditions of Sale
Signature:

Terms and Conditions of Sales

DEFINITIONS

“Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”.

“Buyer”: Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on the one hand and the Buyer on the other hand.

“Intellectual Property Rights” (“IPR”) means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

“License”: For the reports and databases, 2 different licenses are proposed. The buyer has to choose one license:

1. One user license: a single individual at the company can use the report.

2. Multi user license: the report can be used by unlimited users within the company. Subsidiaries are not included.

“Products”: Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

“Seller”: Based in Sophia Antipolis (France headquarters), Knowmade is a technology intelligence company specialized in the research and analysis of scientific and technical information. We provide patent landscapes and scientific state of the art with high added value to businesses and research laboratories. Our intelligence digests play a key role to define your innovation and development strategy.

1. SCOPE

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBJECTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.

1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”. This results in acceptance by the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer’s address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

2. MAILING OF THE PRODUCTS

2.1 Products are sent by email to the Buyer:

- within [1] month from the order for Products already released; or

- within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.

2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including in cases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.

2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.

2.4 The mailing is operated through electronic means either by email via the sales department. If the Product’s electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be

sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to produce sufficient evidence of such defects.

2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

3. PRICE, INVOICING AND PAYMENT

3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.

3.2 Payments due by the Buyer shall be sent by cheque payable to Knowmade, PayPal or by electronic transfer to the following account:

Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France

BIC or SWIFT code: CCBPFRPPMAR

IBAN: : FR76 1460 7003 6360 6214 5695 139

To ensure the payments, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.

3.3 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.

3.4 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

4. LIABILITIES

4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement

4.3 In no event shall the Seller be liable for:

a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller’s website or the Products, or any information provided on the website, or in the Products;

b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.

4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.

4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non-acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of

saleability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

5. FORCE MAJEURE

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

6. PROTECTION OF THE SELLER’S intellectual property

6.1 All intellectual property rights attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.

6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:

- Information storage and retrieval systems;

- Recordings and re-transmittals over any network (including any local area network);

- use in any timesharing, service bureau, bulletin board or similar arrangement or public display;

- Posting any Product to any other online service (including bulletin boards or the Internet);

- Licensing, leasing, selling, offering for sale or assigning the Product.

6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.

7. TERMINATION

7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

8. MISCELLANEOUS

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

9. GOVERNING LAW AND JURISDICTION

9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Grasse, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.

KNOWMADE

Company presentation

Technology Intelligence and IP Strategy consulting company

Electronics | Telecommunications | Photonics | Life Sciences | Healthcare | Agri-Food

Executive team



Dr. Nicolas Baron

CEO and co-founder of Knowmade.

He manages the development and strategic orientation of the company and personally leads the Electronics & Telecom department. He holds a PhD in physics from the University of Nice Sophia-Antipolis, and a Master degree in Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI Strasbourg), France.



Dr. Brice Sagot

CTO and co-founder of Knowmade.

He manages the development of IP analysis tools and methodologies, and personally leads the Life Sciences & Healthcare department. He holds a PhD in molecular biology from the University of Nice Sophia-Antipolis, France.

Analyst team

10+ highly specialized analysts with PhD degree and in-depth knowledge of patents and scientific Information.

Founded in 2009

Headquartered in Sophia Antipolis FRANCE



Sophia Antipolis

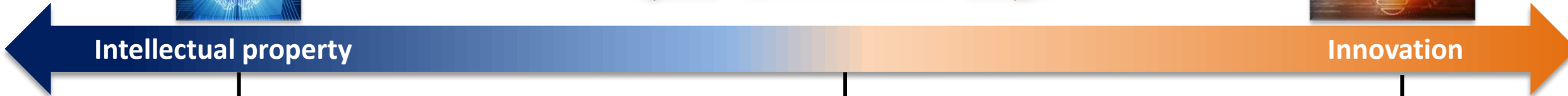


Global presence, with an established base of more than 100 customers worldwide

CUSTOM STUDY & CONSULTING

Tailor-made analysis to meet your needs and budgetary constraints

Knowmade services are at the border between IP and Innovation.
Tailor made analysis allow you to define the scope and focus to fit your needs and budget.



Prior art search

Freedom-to-operate analysis

Litigation and licensing support

Evidence of use

Patent assessment

Assert your product and innovation

Defend your position

Evaluate IP risks

Patent landscape

IP due diligence

Monitoring service

Understand, anticipate and

evaluate the competitive

environment and current

technology developments

Technology scouting

Scientific literature

analysis

Identify, qualify and get

access to external

innovation.

CUSTOM STUDY & CONSULTING

Tailor-made analysis to meet your needs and budgetary constraints

YOUR NEED	CUSTOM STUDY									
	Prior art search	Patent landscape analysis	Freedom-to-operate analysis	Patent-to-product mapping	Litigation & Licensing support	Patent assessment	IP due diligence	Scientific literature analysis	Technology scouting	Technology watch service
Understand the competitive landscape		✓	✓				✓	✓		
Know the key players and their key patents		✓	✓				✓	✓		
Follow the technology trends and identify emerging technologies		✓						✓		✓
Track competitors, their IP activity, strategy and future intents		✓		✓				✓		✓
Know your competitors' strengths and weaknesses		✓	✓			✓	✓	✓		
Early detect business opportunities		✓						✓		✓
Evaluate the patentability of your inventions	✓									
Invalidate competitors' patents	✓				✓			✓		
Prevent registration of critical patents from competitors	✓				✓					
Identify patents used in products				✓	✓	✓	✓			
Make evidence of patent infringement			✓	✓	✓					
Evaluate the risks to infringe someone else's patents			✓	✓	✓		✓			
Mitigate the risks of patent litigation		✓	✓		✓		✓			
Defend your position in licensing negotiation or patent litigation	✓		✓	✓	✓	✓				
Reduce the risks in M&A			✓			✓	✓			
Evaluate your real patent protection					✓		✓			
Benchmark patent portfolios		✓				✓	✓			
Identify the most valuable patents and estimate their financial value				✓		✓			✓	
Monetize your patents and identify potential licensees/buyers				✓	✓	✓				
Acquire technologies or identify potential licensors		✓		✓	✓	✓		✓	✓	
Speed your R&D and enhance your innovation process		✓						✓	✓	✓
Decrease R&D and IP costs	✓		✓		✓	✓			✓	
Identify public domain technologies which are free to use		✓	✓						✓	
Identify key research laboratories and potential R&D partners		✓						✓	✓	

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Reports collection 2019

COMPOUND SEMICONDUCTORS

- **GaN-on-Silicon Substrate: Materials, Devices and Applications** – Patent Landscape 2019*
- **RF GaN: Materials, Devices and Applications** – Patent Landscape 2019*
- **Power SiC: MOSFETs, SBDs and Modules** – Patent Landscape 2019*
- **Power GaN: Materials, Devices and Applications** – Patent Landscape 2019*
- **Patent Trolls in the Semiconductor Market** – Litigation Risk and Potential Targets 2017

POWER ELECTRONICS

- **Power SiC: MOSFETs, SBDs and Modules** – Patent Landscape 2019*
- **Power GaN: Materials, Devices and Applications** – Patent Landscape 2019*
- **Fast Charging Technologies** – Patent Landscape 2019*
- **Wireless Power Charging** – Patent Landscape 2017

BATTERY AND ENERGY MANAGEMENT

- **Solid-State Batteries** – Patent Landscape 2019*
- **Battery Energy Density Increase** – Patent Landscape 2019*
- **Status of the Battery Patents** – Patent Landscape 2018
- **NMC Li-ion Batteries** – Patent Landscape 2017

RF DEVICES & TECHNOLOGIES

- **Antenna for 5G Wireless Communications** – Patent Landscape 2019*
- **RF Filter for 5G Wireless Communications** – Patent Landscape 2019*
- **RF GaN: Materials, Devices and Applications** – Patent Landscape 2019*
- **RF Front End Module for Cellphones** – Patent Landscape 2018
- **RF Acoustic Wave Filters: SAW, FBAR, SMR-BAW** – Patent Landscape 2017

PHOTONICS & OPTOELECTRONICS

- **Silicon Photonics for Data Centers: Optical Transceiver** – Patent Landscape 2019*
- **VCSEL** – Patent Landscape 2018
- **LiDAR for Automotive** – Patent Landscape 2018

DISPLAY

- **MicroLED Displays** – Patent Landscape 2018

IMAGING

- **Facial & Gesture Recognition Technologies in Mobile Devices** – Patent Landscape 2019*
- **VCSEL** – Patent Landscape 2018
- **LiDAR for Automotive** – Patent Landscape 2018
- **iPhone X Proximity Sensor and Flood Illuminator** – Patent-to-Product Mapping 2018

MEDICAL IMAGING & BIOPHOTONICS

- **Optical Coherence Tomography Medical Imaging** – Patent Landscape 2018
- **Biomedical Photoacoustic Imaging** – Patent Landscape 2015

SEMICONDUCTOR MANUFACTURING & PACKAGING

- **Hybrid Bonding for 3D Stack** – Patent Landscape 2019*
- **Fan-Out Wafer/Panel Level Packaging** – Patent Landscape 2019*
- **Fan-Out Wafer Level Packaging** - Patent Landscape 2016

MEMORY

- **Magnetoresistive Random-Access Memory (MRAM)** – Patent Landscape 2019*
- **3D Non-Volatile Memories** – Patent Landscape 2018
- **Patent Trolls in the Semiconductor Market** – Litigation Risk and Potential Targets 2017
- **TSV Stacked Memories** – Patent Landscape 2016

MEMS & SENSORS

- **MEMS Foundry Business IP Portfolio** – Patent Portfolio Analysis 2019*
- **Miniaturized Gas Sensors** – Patent Landscape 2019*
- **LiDAR for Automotive** - Patent Landscape 2018
- **iPhone X Proximity Sensor and Flood Illuminator** - Patent-to-Product Mapping 2018
- **RF Acoustic Wave Filters** - Patent Landscape 2017
- **Knowles MEMS Microphones in Apple iPhone 7 Plus** - Patent-to-Product Mapping 2017
- **Consumer Physics SciO Molecular Sensor** - Patent-to-Product Mapping 2017

BIOMEMS & MEDICAL MICROSYSTEMS

- **3D Cell Printing** – Patent Landscape 2019*
- **Circulating Tumor Cells Isolation** – Patent Landscape 2019*
- **Nanopore Sequencing** - Patent Landscape 2019
- **Microfluidic Manufacturing Technologies** – Patent Landscape 2019*
- **Pumps for Microfluidics** - Patent Landscape 2017
- **Microfluidic Technologies for Diagnostic Applications** - Patent Landscape 2017
- **Fluidigm** - Patent Portfolio Analysis 2017
- **Non-Invasive Glucose Monitoring** - Patent Landscape 2015

BIOTECHNOLOGY & PHARMACEUTICS

- **Personalized Medicine** – Patent Landscape 2019*
- **3D Cell Culture Technologies** – Patent Landscape 2016

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PARTNERS



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www.piseo.fr



KnowMade SARL
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06902 Sophia Antipolis, France

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