

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT6066056

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
SENTIENT TECHNOLOGIES (BARBADOS) LIMITED	12/04/2018
SENTIENT TECHNOLOGIES HOLDINGS LIMITED	12/04/2018
SENTIENT TECHNOLOGIES (USA) LLC	12/04/2018
RECEIVING PARTY DATA	
Name:	COGNIZANT TECHNOLOGY SOLUTIONS U.S. CORPORATION
Street Address:	211 QUALITY CIRCLE
City:	COLLEGE STATION
State/Country:	TEXAS
Postal Code:	77845
PROPERTY NUMBERS Total: 2	
Property Type	Number
Application Number:	16219286
PCT Number:	US1865472
CORRESPONDENCE DATA	
Fax Number:	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
Phone:	8044418530
Email:	dawnmarie@beycotropia.com
Correspondent Name:	DAWN-MARIE BEY, BEY & COTROPIA PLLC
Address Line 1:	213 BAYLY COURT
Address Line 4:	RICHMOND, VIRGINIA 23229
ATTORNEY DOCKET NUMBER:	SEN0029-US; SEN0029-PCT
NAME OF SUBMITTER:	DAWN-MARIE BEY, REG. NO. 44,442
SIGNATURE:	/DAWN-MARIE BEY/
DATE SIGNED:	04/17/2020
Total Attachments: 41	
source=sen0029_executed_patentassignmentagreement_sentienttocognizant#page1.tif	
source=sen0029_executed_patentassignmentagreement_sentienttocognizant#page2.tif	
source=sen0029_executed_patentassignmentagreement_sentienttocognizant#page3.tif	

PATENT ASSIGNMENT AGREEMENT

This Patent Assignment Agreement (this "*Patent Assignment*"), dated as of December 4, 2018 (the "*Effective Date*"), is made by and among COGNIZANT TECHNOLOGY SOLUTIONS U.S. CORPORATION, a Delaware corporation ("*Purchaser*"), SENTIENT TECHNOLOGIES (BARBADOS) LIMITED, a Barbados company ("*Sentient Barbados*"), SENTIENT TECHNOLOGIES HOLDINGS LIMITED, a British Virgin Islands Business Company incorporated under the BVI Business Companies Act, 2004 ("*Sentient BVI*"), and SENTIENT TECHNOLOGIES (USA) LLC, a Delaware limited liability company ("*Sentient U.S.*") (collectively, Sentient Barbados, Sentient BVI and Sentient U.S., "*Seller*"). Purchaser and Seller are sometimes referred to herein individually as a "*Party*" and collectively as the "*Parties*."

RECITALS

WHEREAS, Purchaser and Seller are parties to that certain Asset Purchase Agreement, dated as of the date hereof (the "*Asset Purchase Agreement*"); and

WHEREAS, under the terms of the Asset Purchase Agreement, Seller has conveyed, transferred and assigned to Purchaser, among other assets, patents of the Seller.

NOW, THEREFORE, in consideration of the mutual benefits to be derived from this Patent Assignment and of the representations, warranties, conditions, agreements and promises contained in the Asset Purchase Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, hereby agree to the foregoing and as follows:

1. **Definitions.** Unless otherwise specifically provided herein, capitalized terms used in this Patent Assignment and not otherwise defined herein shall have the respective meanings ascribed thereto in the Asset Purchase Agreement.

2. **Assignment.** For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Seller hereby forever and irrevocably, without reservation, sells, conveys, transfers, and assigns, free and clear of any and all Liens and other encumbrances, to Purchaser, and Purchaser hereby accepts, all worldwide right, title, and interest in and to the following (collectively, the "*Assigned Patents*"):

- a. All patents, patent applications, including provisional and non-provisional patent applications, and PCT applications set forth on **Schedule I** attached hereto;
- b. All foreign and United States continuations, continuation-in-part, divisions, extensions, renewals, reissues, registrations, reexaminations, and substitutes of any such patent, patent application, and PCT application (and any patents granted therefor) in **Schedule I**;
- c. Any patent and patent application, filed or issued in any foreign country or the United States, that claims priority (directly or indirectly, in whole or in part) to or is related by a terminal disclaimer to a patent, patent application, or PCT application (and any patents granted therefor) in **Schedule I**;
- d. All rights of any kind whatsoever of Seller accruing under any of the foregoing provided by applicable law of any jurisdiction (including, without limitation, the right to pay any and all maintenance fees, taxes and the like), foreign country, by international treaties and conventions (including, without limitation, the right to file and prosecute foreign applications and claim priority under the provisions of any international convention or treaty), and otherwise throughout the world;

- e. All royalties, fees, income, payments, and other proceeds now or hereafter due or payable with respect to any and all of the foregoing; and
- f. Any and all claims and causes of action with respect to any of the foregoing, whether accruing before, on, or after the Effective Date, including all rights to and claims for damages, restitution, and injunctive and other legal and equitable relief for past, present, and future infringement, misappropriation, dilution, violation, unauthorized use or disclosure, misuse, breach, or default, with the right but no obligation to sue for such legal and equitable relief and to collect, or otherwise recover, any such past, present, and future damages.

3. **Recordation.** Seller hereby authorizes the Commissioner for Patents in the United States Patent and Trademark Office and the officials of corresponding entities or agencies in any applicable domestic or foreign jurisdictions to record and register this Patent Assignment upon request by Purchaser. Seller hereby further authorizes and requests the appropriate governmental authority to issue all patents resulting from any of the Assigned Patents to Purchaser, as the assignee of the entire interest therein, or to Purchaser's designee.

4. **Further Assurances and Covenant.** Following the Effective Date, upon Purchaser's request, Seller shall take such steps and actions, and execute and deliver such additional instruments and documents, and provide such cooperation and assistance to Purchaser and its successors, assigns, and legal representatives, including the execution and delivery of any affidavits, declarations, oaths, exhibits, assignments, powers of attorney, or other documents, as may be necessary or desirable to effect, evidence, or perfect the assignment of, or for the procurement, maintenance, enforcement and defense of, the Assigned Patents to Purchaser, or any assignee or successor thereto. Seller hereby represents, warrants, and covenants that Seller has not entered into and will not enter into any agreement inconsistent with this Patent Assignment.

5. **Terms of the Asset Purchase Agreement.** The Parties acknowledge and agree that this Patent Assignment is entered into pursuant to the Asset Purchase Agreement, to which reference is made for a further statement of the rights and obligations of Purchaser and Seller with respect to the Assigned Patents. The representations, warranties, covenants, agreements, and indemnities contained in the Asset Purchase Agreement shall not be superseded hereby but shall remain in full force and effect to the full extent provided therein. In the event of any conflict or inconsistency between the terms of the Asset Purchase Agreement and the terms hereof, the terms of the Asset Purchase Agreement shall govern and control.

6. **Successors and Assigns.** This Patent Assignment shall be binding upon and shall inure to the benefit of the Parties and their respective successors and assigns.

7. **Amendment.** This Patent Assignment may not be modified, amended, altered or supplemented except upon the execution and delivery of a written agreement executed by all Parties.

8. **Counterparts.** This Patent Assignment may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed one and the same agreement. A signed copy of this Patent Assignment delivered by facsimile, e-mail, or other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy of this Patent Assignment.

[Signatures appear on next page]

IN WITNESS WHEREOF, the Parties have caused this Patent Assignment to be executed by their duly authorized representatives as of the Effective Date.

PURCHASER:

COGNIZANT TECHNOLOGY SOLUTIONS
U.S. CORPORATION

By: HD
Name: Harry Demas
Title: Vice President, Legal

SELLER:

SENTIENT TECHNOLOGIES (BARBADOS)
LIMITED

By: _____
Name: _____
Title: _____

SENTIENT TECHNOLOGIES HOLDINGS
LIMITED

By: _____
Name: _____
Title: _____

SENTIENT TECHNOLOGIES (USA) LLC

By: _____
Name: _____
Title: _____

IN WITNESS WHEREOF, the Parties have caused this Patent Assignment to be executed by their duly authorized representatives as of the Effective Date.

PURCHASER:

**COGNIZANT TECHNOLOGY SOLUTIONS
U.S. CORPORATION**

By:

Name: Harry Dernas
Title: Vice President, Legal

SELLER:

**SENTIENT TECHNOLOGIES (BARRADOS)
LIMITED**

By:

Name: Antoine Mondesir
Title: Director

**SENTIENT TECHNOLOGIES HOLDINGS
LIMITED**

By:

Name: Babak Hojdat
Title: CEO

SENTIENT TECHNOLOGIES (USA) LLC

By:

Name: Babak Hojdat
Title: President

IN WITNESS WHEREOF, the Parties have caused this Patent Assignment to be executed by their duly authorized representatives as of the Effective Date.

PURCHASER:

**COGNIZANT TECHNOLOGY SOLUTIONS
U.S. CORPORATION**

By: _____

Name: Harry Demas
Title: Vice President, Legal

SELLER:

**SENTIENT TECHNOLOGIES (BARBADOS)
LIMITED**

By: _____

Name: Antoine Blondeau
Title: Director

**SENTIENT TECHNOLOGIES HOLDINGS
LIMITED**

By: _____

Name: Babak Hoidat
Title: CEO

SENTIENT TECHNOLOGIES (USA) LLC

By: _____

Name: Babak Hoidat
Title: President

SCHEDULE I

United States and Foreign Patents, Patent Applications, and PCTs

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Network for Performing Complex Algorithms	P531/10	11/7/08					United Arab Emirates	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Closed	Abandoned
Distributed Evolutionary Algorithm for Asset Management and Trading	P1098/11	4/28/10					United Arab Emirates	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Pending	Response filed 7/2017
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	P1097/11	4/28/10					United Arab Emirates	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Pending	Delaying Expenses
Distributed Network for Performing Complex	2012244171	11/7/08			2012244171	10/29/15	Australia	HODJAT, Babak BLONDEAU, Antoine	Divisional	Issued/Granted	

PATENT

REEL: 052431 FRAME: 0064

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Algorithms								CHEYER, Adam HARRIGAN, Peter			
Distributed Network for Performing Complex Algorithms	2008323758	11/7/08			2008323758	3/14/13	Australia	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Natl Stage with Priority	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management and Trading	2010241594	4/28/10			2010241594	9/3/15	Australia	HODJAT, Babak SHAHRZAD, Hormoz	PCT Natl Stage with Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	2010241597	4/28/10			2010241597	5/7/15	Australia	HODJAT, Babak SHAHRZAD, Hormoz	PCT Natl Stage with Priority	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Network for Performing Complex Algorithms	P10819170-0	11/7/08					Brazil	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Pending	
Distributed Evolutionary Algorithm for Asset Management and Trading	P11011964-7	4/28/10					Brazil	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Pending	Delaying Expenses
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	P11015195-8	4/28/10					Brazil	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Pending	Delaying Expenses
Distributed Network for Performing Complex Algorithms	2,706,119	11/7/08					Canada	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Closed	Abandoned

PATENT

REEL: 052431 FRAME: 0066

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Evolutionary Algorithm for Asset Management and Trading	2,759,986	4/28/10					Canada	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Closed	Abandoned; Can Reinstated
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	2,759,293	4/28/10					Canada	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Closed	Abandoned
Distributed Network for Performing Complex Algorithms	2016103902 34.0	11/7/08	CN 106095570 A	11/9/16			China	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Published	
Distributed Network for Performing Complex Algorithms	2008801203 14.8	11/7/08	CN1019397 27A	1/5/11			China	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam	PCT Nat'l Stage with Priority	Closed	Abandoned

PATENT

REEL: 052431 FRAME: 0067

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Evolutionary Algorithm for Asset Management and Trading	2016105922 04.8	4/28/10	CN 106203630 A	12/7/16			China	HARRIGAN, Peter HODJAT, Babak SHAHRZAD, Hormez	Divisional	Closed	Abandoned; Closed (Instr. 10-2018)
Distributed Evolutionary Algorithm for Asset Management and Trading	2010800188 07.8	4/28/10	CN 102422280 A	4/18/12			China	HODJAT, Babak SHAHRZAD, Hormez	PCT Natl Stage with Priority	Published	Response filed 6/2018
Class-based Distributed Evolutionary System For Asset Management and Trading	2014105293 10.2	4/28/10	CN 104317771 A	1/28/15	ZL 20141052 93102	12/1/17	China	HODJAT, Babak SHAHRZAD, Hormez	Divisional	Issued/Granted	DIV of -6
Class-based Distributed Evolutionary Algorithm for Asset Management	2010800188 00.6	4/28/10	CN1024222 79A	4/18/12	ZL 20108001 88006	9/21/16	China	HODJAT, Babak SHAHRZAD, Hormez	PCT Natl Stage with Priority	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
and Trading											
Distributed Network for Performing Complex Algorithms	08847214.7	11/7/08	2208136	7/21/10			Europe	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nafl Stage with Priority	Closed	Abandoned
Distributed Evolutionary Algorithm for Asset Management and Trading	10770287.0	4/28/10	2422278	2/29/12			Europe	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafl Stage with Priority	Closed	Abandoned; Closed on 6/2018
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	10770288.8	4/28/10	2422276	2/29/12			Europe	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafl Stage with Priority	Closed	Abandoned
Distributed Network for Performing Complex	11103033.0	3/25/11	1149093A	9/23/11			Hong Kong	HODJAT, Babak BLONDEAU, Antoine CHEYER,	Based on Foreign IP Right	Publish ed	

PATENT

REEL: 052431 FRAME: 0069

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Algorithms								Adam HARRIGAN, Peter			
Distributed Network for Performing Complex Algorithms	17101718.0	2/16/17	1228056A	10/27/17			Hong Kong	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Based on Foreign IP Right	Published	
Distributed Evolutionary Algorithm for Asset Management and Trading	12105254.6	5/29/12	1165036A	9/28/12			Hong Kong	HODJAT, Babak SHAHRZAD, Hormoz	Based on Foreign IP Right	Published	Delaying Expenses
Distributed Evolutionary Algorithm for Asset Management and Trading	17104996.7	5/18/17	1231603A	12/22/17			Hong Kong	HODJAT, Babak SHAHRZAD, Hormoz	Based on Foreign IP Right	Published	Delaying Expenses (RCN of -19)
Class-based Distributed Evolutionary Algorithm for Asset	12105252.8	5/29/12	1165035A	9/28/12	1165035B	7/28/17	Hong Kong	HODJAT, Babak SHAHRZAD, Hormoz	Based on Foreign IP Right	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Management and Trading											
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	15106796.6	5/29/12	1206827A	1/15/16			Hong Kong	HODJAT, Babak SHAHRZAD, Hormoz	Based on Foreign IP Right	Published	
Distributed Network for Performing Complex Algorithms	205518	11/7/08	205518	3/31/15	205518	7/1/15	Israel	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nafil Stage with Priority	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management and Trading	239798	4/28/10	239798	4/30/17	239798	7/31/17	Israel	HODJAT, Babak SHAHRZAD, Hormoz	Divisional	Issued/Granted	DIV of -7
Distributed Evolutionary Algorithm for Asset Management and Trading	215728	4/28/10	215728	4/30/17	215728	7/31/17	Israel	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafil Stage with Priority	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Management and Trading								Hormoz			
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	215730	4/28/10	215730	6/30/16	215730	10/1/16	Israel	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms	2851/CHEN P/2010	11/7/08					India	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Closed	Abandoned
Distributed Evolutionary Algorithm for Asset Management and Trading	8584/CHEN P/2011	4/28/10	20/2013	5/17/13			India	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Published	Delaying Expenses
Class-based Distributed Evolutionary Algorithm for Asset	8585/CHEN P/2011	4/28/10					India	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Pending	Delaying Expenses

PATENT

REEL: 052431 FRAME: 0072

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Management and Trading											
Distributed Network for Performing Complex Algorithms	2010-533295	11/7/08			5466163	1/31/14	Japan	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nafl Stage with Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms	2014-010309	11/7/08			5936237	5/20/16	Japan	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management and Trading	2012-508660	4/28/10			5695030	2/13/15	Japan	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafl Stage with Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for	2012-508663	4/28/10			5686795	1/30/15	Japan	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafl Stage with Priority	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Asset Management and Trading								Hornoz			
Content Embedding Using Deep Metric Learning Algorithms							Japan	DUFFY, Nigel LEGRAND, Diego LONG, Philip TSATSIN, Petr	PCT Natl Stage with Priority	Closed	Unified
Distributed Network for Performing Complex Algorithms	10-2010-7012595	11/7/08	2010-0123817	11/25/10			South Korea	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Natl Stage with Priority	Closed	Abandoned
Distributed Network for Performing Complex Algorithms	10-2015-7002601	11/7/08			10-1600303	2/29/16	South Korea	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Issued/Granted	

PATENT

REEL: 052431 FRAME: 0074

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Evolutionary Algorithm for Asset Management and Trading	10-2011-7028270	4/28/10	10-2012-0003010	1/9/12	10-1689908	12/20/16	South Korea	HODJAT, Babak SHAHRZAD, Hormez	PCT Nafli Stage with Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	10-2011-7028271	4/28/10	10-2012-0024660	3/14/12	10-1689909	12/20/16	South Korea	HODJAT, Babak SHAHRZAD, Hormez	PCT Nafli Stage with Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms	PCT/US08/82876	11/7/08	WO 2009/062090	5/14/09			N/A PCT	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	With Priority	Closed	
Distributed Evolutionary Algorithm for Asset Management and Trading	PCT/US10/32841	4/28/10	WO 2010/127039	11/4/10			N/A PCT	HODJAT, Babak SHAHRZAD, Hormez	With Priority	Closed	

PATENT

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	PCT/US10/32847	4/28/10	WO 2010/12704 2	11/4/10			N/A PCT	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Closed	
Alife Machine Learning System and Method	PCT/IB2016/001060	6/27/16	WO 2016/20773 1	12/29/16			N/A PCT	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Closed	
Content Embedding Using Deep Metric Learning Algorithms	PCT/IB2017/053442	6/9/17	WO 2017/21245 9	12/14/17			N/A PCT	DUFFY, Nigel LEGRAND, Diego LONG, Philip TSATSIN, Petr	With Priority	Published	
Distributed Network for Performing Complex Algorithms	2010119652	11/7/08			2502122	12/20/13	Russia	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Issued/Granted	

PATENT

REEL: 052431 FRAME: 0076

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Network for Performing Complex Algorithms	2013122033	11/7/08			2568289	10/16/15	Russia	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management and Trading	2011148006	4/28/10			2541105	2/10/15	Russia	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafll Stage with Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	2011148277	4/28/10			2556374	6/16/15	Russia	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nafll Stage with Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	2015106321	4/28/10			2604673	11/18/16	Russia	HODJAT, Babak SHAHRZAD, Hormoz	Divisional	Issued/Granted	DIV of - 15

PATENT

REEL: 052431 FRAME: 0077

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Distributed Network for Performing Complex Algorithms	201003127-6	11/7/08			161087	1/31/13	Singapore	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	PCT Nat'l Stage with Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms							Singapore	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Closed	Unfiled
Distributed Network for Performing Complex Algorithms	2013004650	11/7/08	190558	6/28/13	190558	5/24/16	Singapore	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Divisional	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management	201107864-9	4/28/10			175360	10/9/14	Singapore	HODJAT, Babak SHAHRZAD, Hormoz	PCT Nat'l Stage with Priority	Issued/Granted	

PATENT

REEL: 052431 FRAME: 0078

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
and Trading											
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	1020140185-4T	4/28/10		9/26/14	1020140185-4T	1/7/16	Singapore	HODJAT, Babak SHAHRZAD, Hormoz	Divisional	Issued/Granted	DIV of -9
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	201107865-6	4/28/10			175361	6/24/14	Singapore	HODJAT, Babak SHAHRZAD, Hormoz	PCT Natl Stage with Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms	97143318	11/10/08	200947225	11/16/09	1479330	4/1/15	Taiwan	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	With Priority	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management	99115667	5/17/10	201142734	12/1/11	1503777	10/11/15	Taiwan	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Issued/Granted	

PATENT

REEL: 052431 FRAME: 0079

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
and Trading											
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading.	99115466	5/14/10	201140484	11/16/11	1549083	9/11/16	Taiwan	HODJAT, Babak SHAZRZAD, Hormez	With Priority	Issued/Granted	
Distributed Network for Performing Complex Algorithms	602986,533	11/8/07					United States	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Provisional	Closed	
Distributed Network for Performing Complex Algorithms	12267,287	11/7/08	2009-0125370-A1	5/14/09			United States	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	With Priority	Closed	Abandoned
Distributed Network for Performing Complex Algorithms	13/443,546	4/10/12	2012-0239517-A1	9/20/12			United States	HODJAT, Babak BLONDEAU, Antoine	Unspecified	Closed	Abandoned

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Algorithms								CHEYER, Adam HARRIGAN, Peter			
Distributed Network for Performing Complex Algorithms	61/075,722	6/25/08					United States	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter	Provisional	Closed	
Distributed Evolutionary Algorithm for Stock Trading	61/173,580	4/28/09					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired
Distributed Evolutionary Algorithm for Asset Management and Trading	12/769,589	4/28/10	2010-0274742-A1	10/28/10	8,527,433	9/3/13	United States	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Issued/Granted	
Distributed Evolutionary Algorithm for Asset Management	13/895,238	5/15/13	2013-0254142-A1	9/26/13	8,825,560	9/2/14	United States	HODJAT, Babak BLONDEAU, Antoine CHEYER, Peter	Divisional	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
and Trading								Adam HARRIGAN, Peter SHAHRZAD, Hormoz			
Distributed Evolutionary Algorithm for Asset Management and Trading	14/014,063	8/29/13	2014-0006316-A1	1/2/14	8,918,349	12/23/14	United States	HODJAT, Babak BLONDEAU, Antoine CHEYER, Adam HARRIGAN, Peter SHAHRZAD, Hormoz	Continuation-in-Part	Issued/Granted	
Distributed Evolutionary Algorithm for Stock Trading	61/173,581	4/29/09					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired
Distributed Evolutionary Algorithm for Stock Trading	61/173,582	4/28/09					United States	HODJAT, Babak SHAHRZAD, Hormoz HARRIGAN, Peter BLONDEAU, Antoine	Provisional	Closed	Expired

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Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	12/769,605	4/28/10	2010-0274736-A1	10/28/10	8,768,811	7/1/14	United States	HODJAT, Babak SHAHRZAD, Hormez	With Priority	Issued/Granted	
Class-based Distributed Evolutionary Algorithm for Asset Management and Trading	14/259,005	4/22/14	2014-0229362-A1	8/14/14			United States	HODJAT, Babak SHAHRZAD, Hormez	Divisional	Published	
Age-layered Population for The Age-varying Fitness Model	61/453,891	3/17/11					United States	HODJAT, Babak SHAHRZAD, Hormez HORNBY, Greg	Provisional	Closed	
Data Mining Technique With Experience-layered Gene Pool	13/184,307	7/15/11			8,909,570	12/9/14	United States	HODJAT, Babak SHAHRZAD, Hormez HORNBY, Greg	With Priority	Issued/Granted	

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REEL: 052431 FRAME: 0083

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Data Mining Technique With Experience-layered Gene Pool	14/539,908	11/12/14			9,684,875	6/20/17	United States	HODJAT, Babak SHAHRZAD, Hormez HORNBY, Greg	Continuation/Additional	Issued/Granted	
Data Mining Technique With Experience-layered Gene Pool	15/179,801	6/10/16	US-2016-0283563-A1	9/29/16	9,734,215	8/15/17	United States	HODJAT, Babak SHAHRZAD, Hormez HORNBY, Greg	Continuation/Additional	Issued/Granted	
Maintaining Fitness History In The Experience-varying Fitness Model	61/559,595	11/14/11					United States	HODJAT, Babak SHAHRZAD, Hormez	Provisional	Closed	
Data Mining Technique With Maintenance Of Fitness History	13/358,381	1/25/12	2013-0124440-A1	5/16/13	9,002,759	4/7/15	United States	HODJAT, Babak SHAHRZAD, Hormez	With Priority	Issued/Granted	

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REEL: 052431 FRAME: 0084

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Data Mining Technique With Diversity Promotion	13/540,507	7/2/12			8,977,581	3/10/15	United States	HODJAT, Babak SHAHRZAD, Hormoz	Priority Application	Issued/Granted	
Data Mining Technique With Induced Environmental Alteration	61/672,185	7/16/12					United States	HODJAT, Babak SHAHRZAD, Hormoz DEMANEUF, Gilles	Provisional	Closed	
Data Mining Technique With Induced Environmental Alteration	13/943,630	7/16/13			9,367,816	6/14/16	United States	HODJAT, Babak SHAHRZAD, Hormoz DEMANEUF, Gilles	With Priority	Issued/Granted	
DATA MINING TECHNIQUE WITH INDUCED ENVIRONMENTAL ALTERATION	61/672,185	7/16/12					United States	DEMANEUF, Gilles HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0085

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Evolutionary Technique With n-Pool Evolution	13/945,630	7/18/13			9,304,895	4/5/16	United States	HODJAT, Babak SHAHRZAD, Hormez KAMALI, Kaivan FINK, Daniel	With Priority	Issued/Granted	
Data Mining Technique with n-Pool Evolution	15/071,016	3/15/16			10,025,700	7/17/18	United States	HODJAT, Babak SHAHRZAD, Hormez KAMALI, Kaivan FINK, Daniel	Continuation-in-Part	Issued/Granted	
Data Mining Technique With Shadow Individuals	13/830,278	3/14/13			9,256,837	2/9/16	United States	HODJAT, Babak SHAHRZAD, Hormez	Priority Application	Issued/Granted	
Data Mining Technique With Position Labeling	61/789,387	3/15/13					United States	HODJAT, Babak SHAHRZAD, Hormez KAMALI, Kaivan FINK, Daniel	Provisional	Closed	
Data Mining Technique With Position	14/209,933	3/13/14			9,710,764	7/18/17	United States	HODJAT, Babak SHAHRZAD, Hormez KAMALI, Kaivan FINK, Daniel	With Priority	Issued/Granted	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Labeling								Hormoz KAMALI, Kaivan FINK, Daniel			
Data Mining Technique With Federated Evolutionary Coordination	14/011,062	8/27/13			9,466,023	10/11/16	United States	HODJAT, Babak SHAHRZAD, Hormoz	Continuation-in-Part	Issued/Granted	
Data Mining Technique With Maintenance Of Ancestry Counts	61/932,659	1/28/14					United States	SHAHRZAD, Hormoz FINK, Daniel	Provisional	Closed	Expired
Data Mining Technique With Maintenance Of Ancestry Counts	14/595,991	1/13/15					United States	SHAHRZAD, Hormoz FINK, Daniel	With Priority	Pending	
Alife Problem Solving System	62/184,803	6/25/15					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0087

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
AI/ML Machine Learning System and Method	15/851,294	12/21/17	US-2018-0114118-AI	4/26/18			United States	HODJAT, Babak SHAHRZAD, Hormez	Continuation-in-Part	Published	
Data Mining Management Server	62/213,063	9/1/15					United States	WHITTAKER, Thomas BAYNES, Jr., Robert	Provisional	Closed	Expired
Data Mining Management Server	15/255,006	9/1/16	US-2017-0060963-AI	3/2/17			United States	WHITTAKER, Thomas BAYNES, Jr., Robert	With Priority	Published	
Data Mining Technique with Distributed Novelty Search	15/146,846	5/4/16	US-2017-0323219-AI	11/9/17			United States	HODJAT, Babak SHAHRZAD, Hormez MIKKULAI NEN, Risto	Priority Application	Published	
Content Embedding Using Deep Metric Learning Algorithms	62/348,097	6/9/16					United States	DUFFY, Nigel LEGRAND, Diego LONG, Philip TSATSIN, Petr	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0088

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Content Embedding Using Deep Metric Learning Algorithms	15/619,299	6/9/17	US 2017-357896 A1	12/14/17			United States	DUFFY, Nigel LEGRAND, Diego LONG, Philip TSAISIN, Peir	With Priority	Published	
Project Scheduling in a Heterogeneous Distributed Computing Environment with Optional Compute Auctioning	62/372,194	8/8/16					United States	HILTON, Kenneth	Provisional	Closed	Expired
Project Scheduling in a Heterogeneous Distributed Computing Environment	15/671,891	8/8/17					United States	HILTON, Kenneth MUTCH, Karl	With Priority	Pending	
Distributed Rule-Based Probabilistic Time-Series	62/320,412	4/8/16					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0089

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Classifier											
Distributed Rule-Based Probabilistic Time-Series Classifier	15/481,992	4/7/17	US 2017-0293849 A1	10/12/17			United States	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Published	
Filtering of Genetic Material in Incremental Fitness Evolutionary Algorithms based on Thresholds	62/413,324	10/26/16					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired
Filtering of Genetic Material in Incremental Fitness Evolutionary Algorithms based on Thresholds	15/791,277	10/23/17	US-2018-0113977-A1	4/26/18			United States	HODJAT, Babak SHAHRZAD, Hormoz	With Priority	Published	
Detecting Behavioral	62/397,863	9/21/16					United States	HODJAT, Babak	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0090

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Anomaly											
Detecting Behavioral Anomaly in Machine Learned Rule Sets	15/710,732	9/20/17	US 2018-0083996 A1	3/22/18			United States	HODJAT, Babak	With Priority	Published	
Evolution of Deep Neural Network Structures	62/412,830	10/26/16					United States	MIKKULAI NEN, Risto LIANG, Jason	Provisional	Closed	Expired
Evolution of Deep Neural Network Structures	15/794,905	10/26/17	US-2018-0114115-A1	4/26/18			United States	MIKKULAI NEN, Risto LIANG, Jason	With Priority	Published	
Cooperative Evolution of Deep Neural Network Structures	62/413,176	10/26/16					United States	MIKKULAI NEN, Risto LIANG, Jason	Provisional	Closed	Expired
Cooperative Evolution of Deep Neural Network Structures	15/794,913	10/26/17	US-2018-0114116-A1	4/26/18			United States	MIKKULAI NEN, Risto LIANG, Jason	With Priority	Published	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Selecting A Winner In Evolutionary Optimization	62/466,227	3/2/17					United States	SHAHZAD, Hormoz DUFFY, Nigel LONG, Philip MIKKULAI NEN, Risto	Provisional	Closed	Expired
Method and System for Finding a Solution to a Problem by Selecting a Winner in Evolutionary Optimization of a Genetic Algorithm	15/911,048	3/2/18	US-2018-0253649-A1	9/6/18			United States	SHAHZAD, Hormoz DUFFY, Nigel LONG, Philip MIKKULAI NEN, Risto	With Priority	Publish ed	
Asynchronous Evaluation Strategy For Evolution Of Deep Neural Networks	62/468,224	3/7/17					United States	HODJAT, Babak SHAHZAD, Hormoz MIKKULAI NEN, Risto LIANG, Jason	Provisional	Closed	Expired
Asynchronous Evaluation Strategy For	15/915,028	3/7/18	US-2018-0260713-	9/13/18			United States	HODJAT, Babak SHAHZAD,	With Priority	Publish ed	

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REEL: 052431 FRAME: 0092

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Evolution Of Deep Neural Networks			AI					Hormoz MIKKULAI NEN, Risto LIANG, Jason			
Discovering Evolutionary Stepping Stones Through Behavior Domination	62/467,061	3/3/17					United States	MIKKULAI NEN, Risto MEYERSON, Elliot	Provisional	Closed	Expired
Behavior Dominated Search in Evolutionary Search Systems	15/912,475	3/5/18					United States	MIKKULAI NEN, Risto MEYERSON, Elliot	With Priority	Pending	
Data Mining Technique with Nested Experience-Layered Individual Pool	62/534,622	7/19/17					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired
Training and Control System for Evolving	16/038,074	7/17/18	US 2018-0322395 A1	11/8/18			United States	SHAHRZAD, Hormoz HODJAT, Babak	Continuation-in-Part	Published	

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REEL: 052431 FRAME: 0093

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Solutions to Data-Intensive Problems Using Nested-Experience-Layered Individual Pool											
Data Mining Technique with Epigenetic Enabled Individuals	62/539,417	7/31/17					United States	HODJAT, Babak SHAHRZAD, Hormoz	Provisional	Closed	Expired
Data Mining Technique with Epigenetic Enabled Individuals	16/049,584	7/30/18					United States	HODJAT, Babak SHAHRZAD, Hormoz LAL, Raghav	With Priority	Pending	
Automated and Unsupervised Generation of Real-World Training Data	62/554,424	9/5/17					United States	SALJOU, Antoine	Provisional	Closed	Expired

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REEL: 052431 FRAME: 0094

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Automated and Unsupervised Generation of Real-World Training Data	16/122,695	9/5/18					United States	SALIOU, Antoine	With Priority	Pending	
Automated and Unsupervised Generation of Real-World Training Data	16/150,101	10/2/18					United States	SALIOU, Antoine	Continuation-in-Part	Pending	
Deep Multitask Learning Through Soft Layer Ordering	62/578,035	10/27/17					United States	MIKKULAJ NEN, Risto MEYERSON, Elliot	Provisional	Closed	Expired
Beyond Shared Hierarchies: Deep Multitask Learning Through Soft Layer Ordering	16/172,660	10/26/18					United States	MEYERSON, Elliot MIKKULAJ NEN, Risto	With Priority	Await Exam	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Evolving Multitask Neural Network Structure	62/598,409	12/13/17					United States	MIKKULAI NEN, Risto LIANG, Jason MEYERSON, Elliot RAWAL, Aditya	Provisional	Pending	
Evolutionary Architecture Search for Deep Multitask Networks	62/627,166	2/6/18					United States	MIKKULAI NEN, Risto LIANG, Jason MEYERSON, Elliot	Provisional	Pending	
Evolutionary Architectures for Evolution of Deep Neural Networks	62/662,082	4/24/18					United States	MIKKULAI NEN, Risto LIANG, Jason MEYERSON, Elliot	Provisional with Priority	Pending	
Enhanced Optimization with Composite Objectives and Novelty Selection	62/627,125	2/6/18					United States	SHARZAD, Hormoz FINK, Daniel MIKKULAI NEN, Risto	Provisional	Pending	

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Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Enhanced Optimization with Composite Objectives and Novelty Selection	62/658,859	4/17/18					United States	SHAHRAZAD, Hormoz FINK, Daniel MIKKULAI NEN, Risto	Provisional	Pending	
From Nodes to Networks: Evolving Recurrent Neural Networks	62/627,161	2/6/18					United States	RAWAL, Aditya MIKKULAI NEN, Risto	Provisional	Pending	
From Nodes to Networks: Evolving Recurrent Neural Networks	62/627,658	2/7/18					United States	MIKKULAI NEN, Risto RAWAL, Aditya	Provisional with Priority	Pending	
Evolving Recurrent Networks Using Genetic Programming	62/672,200	5/16/18					United States	MIKKULAI NEN, Risto RAWAL, Aditya	Provisional with Priority	Pending	
Enhancing Evolutionary Optimization	62/627,088	2/6/18					United States	MIKKULAI NEN, Risto QIU, Xin	Provisional	Pending	

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
in Uncertain Environments via Multi-armed Bandit Algorithms											
Enhancing Evolutionary Optimization in Uncertain Environments by Allocating Evaluations via Multi-Armed Bandit Algorithms	62/641,864	3/12/18					United States	QIU, Xin MIKKULAI NEN, Risto	Provisional	Pending	
Pseudo-task Augmentatio n: From Deep Multitask Learning to Intratask Sharing and Back	62/628,248	2/8/18					United States	MIKKULAI NEN, Risto MEYERSON, Elliot	Provisional	Pending	
Pseudo-task Augmentatio n: From Deep Multitask Learning to	62/684,125	6/12/18					United States	MIKKULAI NEN, Risto MEYERSON, Elliot	Provisional	Pending	

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REEL: 052431 FRAME: 0098

Title	Application No.	Filing Date	Publication No.	Publication Date	Patent No.	Issue Date	Country	Inventor	Type	Status	Notes
Intrask Sharing and Back											
Systems and Methods for Providing Secure Evolution as a Service	62/677,571	5/29/18					United States	FINK, Daniel FRANCON, Olivier	Provisional	Pending	
Systems and Methods for Providing Data-Driven Evolution of Arbitrary Data Structures	62/694,194	7/5/18					United States	FINK, Daniel	Provisional	Pending	
Multiobjecti ve Coevolution of Deep Neural Network Architectures	62/754,242	11/1/18					United States	LIANG, Jason MEYERSON, Elliot MIKKULAJ NEN, Risto	Provisional	Pending	

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