PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1   EPAS ID: PAT4967026
Stylesheet Version v1.2

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
BRIAN RIES	10/05/2017
JUAN CHRISTIAN FERRETTI-SMYTHE	10/05/2017
CHARLES WRIGHT	10/05/2017
OLEG VYDROV	10/10/2017
RYAN CAUDY	10/05/2017
DAVID R. KENT IV	10/05/2017
NATHANIEL J. DORFMAN	10/18/2017
RADU TEODORESCU	11/29/2017
MARK ZELDIS	10/05/2017
HERVE BRONNIMANN	11/20/2017
RAFFI BASRALIAN	10/21/2017

RECEIVING PARTY DATA

Name:	ILLUMON LLC
Street Address:	2800 NIAGARA LANE NORTH
City:	PLYMOUTH
State/Country:	MINNESOTA
Postal Code:	55447

PROPERTY NUMBERS Total: 5

Property Type	Number
Application Number:	15428145
Application Number:	15464314
Application Number:	15897547
Application Number:	15796230
Application Number:	15610162

CORRESPONDENCE DATA

Fax Number:

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.

Phone: 7036469255

Email:	susan@carmichaelip.com
Correspondent Name:	JAMES T. CARMICHAEL
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Address Line 2:	8000 TOWERS CRESCENT DRIVE, 13TH FLOOR
Address Line 4:	TYSONS CORNER, VIRGINIA 22182

ATTORNEY DOCKET NUMBER:	ILLUMON-ASSIGNMENTS
NAME OF SUBMITTER:	SUSAN STILES
SIGNATURE:	/Susan Stiles/
DATE SIGNED:	05/17/2018

Total Attachments: 33

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ASSIGNMENT

WHEREAS, I, Brian Ries, have invented or co-invented inventions disclosed in one or more of the patent applications listed in Table A that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.
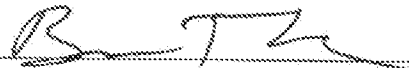
Table A

Appln. No.	Filing Date	Title
62/161,813	5/14/2015	COMPUTER DATA SYSTEM
15/154,974	5/14/2016	DATA PARTITIONING AND ORDERING
15/154,975	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

**PATENT
REEL: 046583 FRAME: 0092**

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
15/154,991	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
15/154,993	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
15/154,995	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/154,997	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
15/154,998	5/14/2016	DYNAMIC CODE LOADING
15/154,999	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
15/155,001	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/155,005	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/155,006	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
15/155,007	5/14/2016	APPLYING A GUI DISPLAY EFFECT FORMULA IN A HIDDEN COLUMN TO A SECTION OF DATA
15/155,009	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
15/155,010	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
15/155,011	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
15/155,012	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
PCT/US16/32593	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
PCT/US16/32594	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
PCT/US16/32607	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: _2017 -10 - 5_

Brian Ries

ASSIGNMENT

WHEREAS, I, Juan Cristian Ferretti-Smythe, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

Table A

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15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX

10/5/2017

PATENT
REEL: 046583 FRAME: 0008

		REMOTE QUERY PROCESSOR QUERY OPERATIONS
15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
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PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION

10/5/2017

		OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
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62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/5/2017

Juan Cristian Ferretti-Smythe

ASSIGNMENT

WHEREAS, I, Charles Wright, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

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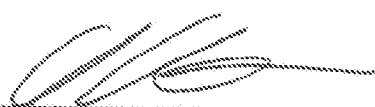
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PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
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PCT/US16/32594	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
PCT/US16/32607	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/5/17

Charles Wright

ASSIGNMENT

WHEREAS, I, Oleg Vydrov, have invented or co-invented inventions disclosed in one or more of the patent applications listed in Table A that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

Table A

Appln. No.	Filing Date	Title
62/161,813	5/14/2015	COMPUTER DATA SYSTEM
15/154,974	5/14/2016	DATA PARTITIONING AND ORDERING
15/154,975	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
15/154,991	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
15/154,993	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
15/154,995	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/154,997	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
15/154,998	5/14/2016	DYNAMIC CODE LOADING
15/154,999	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
15/155,001	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/155,005	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/155,006	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
15/155,007	5/14/2016	APPLYING A GUI DISPLAY EFFECT FORMULA IN A HIDDEN COLUMN TO A SECTION OF DATA
15/155,009	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
15/155,010	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
15/155,011	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
15/155,012	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
PCT/US16/32593	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
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PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
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PCT/US16/32607	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/10/2017

Oleg Vydrov

ASSIGNMENT

WHEREAS, I, Ryan Caudy, have invented or co-invented inventions disclosed in one or more of the patent applications listed in Table A that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

Table A

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15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
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PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
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PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

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PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
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PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
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PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
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PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
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15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/5/2017

Ryan Caudy

ASSIGNMENT

WHEREAS, I, <u>David R. Kent IV</u>, have invented or co-invented inventions disclosed in one or more of the patent applications listed in <u>Table A</u> that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, <u>Illumon LLC</u> ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

Table A

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15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
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15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
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PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

Assignment

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
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15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/5/17

David R. Kent IV

ASSIGNMENT

WHEREAS, I, <u>Nathaniel J. Dorfman</u>, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, <u>Illumon LLC</u> ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

Table A

Appln. No.	Filing Date	Title
62/161,813	5/14/2015	COMPUTER DATA SYSTEM
15/154,974	5/14/2016	DATA PARTITIONING AND ORDERING
15/154,975	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

**PATENT
REEL: 046563 FRAME: 0050**

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
15/154,991	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
15/154,993	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
15/154,995	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/154,997	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
15/154,998	5/14/2016	DYNAMIC CODE LOADING
15/154,999	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
15/155,001	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/155,005	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/155,006	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
15/155,007	5/14/2016	APPLYING A GUI DISPLAY EFFECT FORMULA IN A HIDDEN COLUMN TO A SECTION OF DATA
15/155,009	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
15/155,010	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
15/155,011	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
15/155,012	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
PCT/US16/32593	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
PCT/US16/32594	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
PCT/US16/32607	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/18/2017

Nathaniel J Dorfman

ASSIGNMENT

WHEREAS, I, Radu Teodorescu, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

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15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

PATENT
REEL: 046583 FRAME: 0090

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
15/154,991	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
15/154,993	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
15/154,995	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/154,997	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
15/154,998	5/14/2016	DYNAMIC CODE LOADING
15/154,999	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
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15/155,012	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

PATENT
REEL: 046563 FRAME: 0084

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
PCT/US16/32593	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
PCT/US16/32594	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
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15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 11/29/2017

Radu Teodorescu

ASSIGNMENT

WHEREAS, I, <u>Mark Zeldis</u>, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, <u>Illumon LLC</u> ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

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15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

PATENT
REEL: 046583 FRAME: 0036

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
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PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

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PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
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PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
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15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: 10/5/17

Mark Zeldis

ASSIGNMENT

WHEREAS, I, Herve Bronnimann, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.
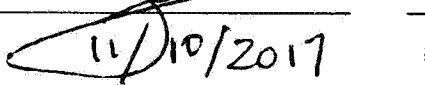
Table A

Appln. No.	Filing Date	Title
62/161,813	5/14/2015	COMPUTER DATA SYSTEM
15/154,974	5/14/2016	DATA PARTITIONING AND ORDERING
15/154,975	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
15/154,979	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
15/154,980	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS

**PATENT
REEL: 046563 FRAME: 0030**

15/154,983	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES
15/154,984	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
15/154,985	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
15/154,987	5/14/2016	DYNAMIC FILTER PROCESSING
15/154,988	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
15/154,990	5/14/2016	DYNAMIC TABLE INDEX MAPPING
15/154,991	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
15/154,993	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
15/154,995	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/154,996	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/154,997	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
15/154,998	5/14/2016	DYNAMIC CODE LOADING
15/154,999	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
15/155,001	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
15/155,005	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
15/155,006	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
15/155,007	5/14/2016	APPLYING A GUI DISPLAY EFFECT FORMULA IN A HIDDEN COLUMN TO A SECTION OF DATA
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15/155,011	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
15/155,012	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
PCT/US16/32581	5/14/2016	DATA PARTITIONING AND ORDERING
PCT/US16/32582	5/14/2016	COMPUTER DATA SYSTEM DATA SOURCE REFRESHING USING AN UPDATE PROPAGATION GRAPH
PCT/US16/32584	5/14/2016	COMPUTER DATA SYSTEM POSITION-INDEX MAPPING
PCT/US16/32586	5/14/2016	SYSTEM PERFORMANCE LOGGING OF COMPLEX REMOTE QUERY PROCESSOR QUERY OPERATIONS
PCT/US16/32587	5/14/2016	DISTRIBUTED AND OPTIMIZED GARBAGE COLLECTION OF REMOTE AND EXPORTED TABLE HANDLE LINKS TO UPDATE PROPAGATION GRAPH NODES

PCT/US16/32588	5/14/2016	COMPUTER DATA SYSTEM CURRENT ROW POSITION QUERY LANGUAGE CONSTRUCT AND ARRAY PROCESSING QUERY LANGUAGE CONSTRUCTS
PCT/US16/32589	5/14/2016	PARSING AND COMPILING DATA SYSTEM QUERIES
PCT/US16/32590	5/14/2016	DYNAMIC FILTER PROCESSING
PCT/US16/32591	5/14/2016	DYNAMIC JOIN PROCESSING USING REAL-TIME MERGED NOTIFICATION LISTENER
PCT/US16/32592	5/14/2016	DYNAMIC TABLE INDEX MAPPING
PCT/US16/32593	5/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
PCT/US16/32594	5/14/2016	A MEMORY-EFFICIENT COMPUTER SYSTEM FOR DYNAMIC UPDATING OF JOIN PROCESSING
PCT/US16/32595	5/14/2016	QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32596	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32597	5/14/2016	DYNAMIC UPDATING OF QUERY RESULT DISPLAYS
PCT/US16/32598	5/14/2016	DYNAMIC CODE LOADING
PCT/US16/32599	5/14/2016	IMPORTATION, PRESENTATION, AND PERSISTENT STORAGE OF DATA
PCT/US16/32600	5/14/2016	COMPUTER DATA DISTRIBUTION ARCHITECTURE
PCT/US16/32601	5/14/2016	PERSISTENT QUERY DISPATCH AND EXECUTION ARCHITECTURE
PCT/US16/32602	5/14/2016	SINGLE INPUT GRAPHICAL USER INTERFACE CONTROL ELEMENT AND METHOD
PCT/US16/32603	5/14/2016	GRAPHICAL USER INTERFACE DISPLAY EFFECTS FOR A COMPUTER DISPLAY SCREEN
PCT/US16/32604	5/14/2016	COMPUTER ASSISTED COMPLETION OF HYPERLINK COMMAND SEGMENTS
PCT/US16/32605	5/14/2016	HISTORICAL DATA REPLAY UTILIZING A COMPUTER SYSTEM
PCT/US16/32606	5/14/2016	DATA STORE ACCESS PERMISSION SYSTEM WITH INTERLEAVED APPLICATION OF DEFERRED ACCESS CONTROL FILTERS
PCT/US16/32607	5/14/2016	REMOTE DATA OBJECT PUBLISHING/SUBSCRIBING SYSTEM HAVING A MULTICAST KEY-VALUE PROTOCOL
15/351,429	11/14/2016	QUERY TASK PROCESSING BASED ON MEMORY ALLOCATION AND PERFORMANCE CRITERIA
62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: _11/10/2017_ _____ Herve Bronnimann

ASSIGNMENT

WHEREAS, I, Raffi Basralian, have invented or co-invented inventions disclosed in one or more of the patent applications listed in **Table A** that were filed in the United States Patent and Trademark Office (referred to hereinafter as "the applications"); and

WHEREAS, Illumon LLC ("ASSIGNEE"), a corporation or other business entity duly organized under the laws of the State of Delaware in the United States of America, desires to acquire the entire right, title, and interest in and to the inventions, the applications, and any Letters Patent granted or to be granted for the inventions in the United States and in all foreign countries;

NOW, THEREFORE, in consideration of One Dollar ($1.00) paid to me by ASSIGNEE, and other good and valuable consideration, the receipt and sufficiency of which I acknowledge, I have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto ASSIGNEE, its successors, legal representatives, and assigns, my entire interest, if any, in and to the inventions, the applications, all applications claiming benefit of the applications, including, but not limited to, all divisions, continuations, and continuations-in-part of the applications, and all Letters Patent that have been granted or may be granted thereon in the United States and in all foreign countries, and all reissues thereof, together with the right to claim priority under the International Convention in all member countries; and I authorize and request the United States Patent and Trademark Office to issue all Letters Patent for the inventions to ASSIGNEE, its successors, legal representatives, and assigns in accordance with the terms of this Assignment;

AND I covenant and agree that I have the full right to convey the entire interest herein assigned and that I have not executed and will not execute any assignment or other instrument in conflict with this Assignment;

AND I further covenant and agree that upon request by ASSIGNEE, its successors, legal representatives, and/or assigns, and without further consideration, I will do all lawful acts that may be necessary or desirable to assist ASSIGNEE, its successors, legal representatives, and/or assigns to obtain and enforce patent protection for the inventions in the United States and in all foreign countries, including, but not limited to, communicate with ASSIGNEE, its successors, legal representatives, and/or assigns any facts known to me regarding the inventions, testify in any legal proceeding, sign all lawful papers, execute and deliver all papers that may be necessary or desirable to perfect the title to the inventions in ASSIGNEE, its successors, legal representatives, and/or assigns, execute all divisional, continuation, and reissue applications, and make all rightful oaths, it being understood that any expense incident to the rendering of such assistance will be borne by ASSIGNEE, its successors, legal representatives, and/or assigns, and it being further understood that I will render such assistance even if my employment, if any, by ASSIGNEE, its successors, legal representatives, and/or assigns, has been terminated.

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62/549,908	08/24/2017	COMPUTER DATA SYSTEM

Dated: _10/21/2017_   _Raffi Basralian_
                                        Raffi Basralian