

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4968979

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
ERIC ZAVESKY	05/16/2018
LEE BEGEJA	05/16/2018
RAGHURAMAN GOPALAN	05/16/2018
BERNARD S. RENGER	05/16/2018
BEHZAD SHAHRARAY	05/16/2018
ZHU LIU	05/16/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	AT&T INTELLECTUAL PROPERTY I, L.P.
<b>Street Address:</b>	675 WEST PEACHTREE STREET
<b>City:</b>	ATLANTA
<b>State/Country:</b>	GEORGIA
<b>Postal Code:</b>	30308
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15984052
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(732)542-2283
<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>	
<b>Phone:</b>	7325422280
<b>Email:</b>	tnewman@trbkllaw.com
<b>Correspondent Name:</b>	AT&T LEGAL DEPARTMENT - TRBK
<b>Address Line 1:</b>	ONE AT&T WAY
<b>Address Line 2:</b>	ROOM 2A-212
<b>Address Line 4:</b>	BEDMINSTER, NEW JERSEY 07921
<b>NAME OF SUBMITTER:</b>	TARA NEWMAN
<b>SIGNATURE:</b>	/T. Newman/
<b>DATE SIGNED:</b>	05/18/2018
<b>Total Attachments: 13</b>	

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ASSIGNMENT

WHEREAS I, **Eric Zavesky**, residing at **Austin, Texas**, hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS**" having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a partnership organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;


AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 16 day of May, 2018.

  
Eric Zavesky

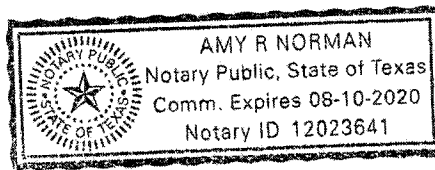
State of Texas )

County of Travis )

On this 16 day of May, 2018, before me a Notary Public in and for the above County and State, personally appeared **Eric Zavesky**, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

  
Notary Public

My Commission Expires: 8-10-20



ASSIGNMENT

WHEREAS I, **Lee Begeja** residing at **Gillette, New Jersey** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled **"AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS"** having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a partnership organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee, and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 15 day of May 2018.

Lee Begeja  
Lee Begeja

State of NT,  
County of Somerset

On this 16 day of May, 2018, before me a Notary Public in and for the above County and State, personally appeared Lee Begeja, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

Richard S. [Signature]  
Notary Public

RICHARD S. TOYE  
NOTARY PUBLIC OF NEW JERSEY  
ID # 21360

My Commission Expires \_\_\_\_\_

ASSIGNMENT

WHEREAS I, **Raghuraman Gopalan** residing at **Dublin, California** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS**" having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a **partnership** organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

**PATENT**

possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

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IN TESTIMONY WHEREOF, I have hereunto set my hand this 16 day of May, 2018.



**Raghuraman Gopalan**

State of \_\_\_\_\_ )

County of \_\_\_\_\_ )

**PLEASE SEE  
ATTACHED**

On this \_\_\_ day of \_\_\_\_\_, 2018, before me a Notary Public in and for the above County and State, personally appeared **Raghuraman Gopalan**, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_



**ACKNOWLEDGMENT**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California, County of Alameda

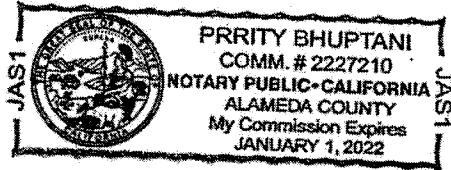
On 16<sup>th</sup> MAY, 2018 before me, PRRITY BHUPTANI, NOTARY PUBLIC

personally appeared RAGHURAMAN GOPALAN who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that ~~he~~~~she~~~~they~~ executed the same in ~~his~~~~her~~~~their~~ authorized capacity(ies), and that by ~~his~~~~her~~~~their~~ signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature PRRITY BHUPTANI



Seal

**OPTIONAL**

*Though the information in this section is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.*

**Description of Attached Document**

Title or Type of Document: Assignment

Document Date: 5/16/2018 Identifying No.: 2017-1273 No. of Pages: 2

Signer(s) or Issuing Agency: \_\_\_\_\_

**Capacity Claimed by Custodian**

Individual  Attorney  Trustee  Business Proprietor or Manager

Corporate Officer — Title: \_\_\_\_\_

University or School Officer — Title: \_\_\_\_\_

Governmental Officer or Agent — Title: \_\_\_\_\_

Other: \_\_\_\_\_

Custodian Is Representing: \_\_\_\_\_

ASSIGNMENT

WHEREAS I, **Bernard S. Renger** residing at **New Providence, New Jersey** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS**" having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a partnership organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

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IN TESTIMONY WHEREOF, I have hereunto set my hand this 16<sup>th</sup> day of May, 2018.

B Renger  
Bernard S. Renger

State of New Jersey )  
County of Somerset )

On this \_\_\_ day of MAY 16 2018, 2018, before me a Notary Public in and for the above County and State, personally appeared **Bernard S. Renger**, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

RICHARD SETO YEE  
NOTARY PUBLIC OF NEW JERSEY  
ID # 2439861  
My Commission Expires 10/22/2018

Richard S Yee  
Notary Public

My Commission Expires: \_\_\_\_\_

ASSIGNMENT

WHEREAS I, **Behzad Shahraray** residing at **Holmdel, New Jersey** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS**" having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a **partnership** organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

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AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

**PATENT**

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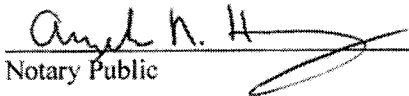
IN TESTIMONY WHEREOF, I have hereunto set my hand this 16<sup>th</sup> day of May, 2018.

  
Behzad Shahraray

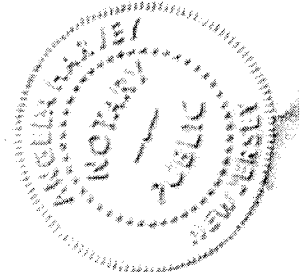
State of New Jersey )

County of Monmouth )

On this 16 day of May, 2018, before me a Notary Public in and for the above County and State, personally appeared **Behzad Shahraray**, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

  
Notary Public

My Commission Expires: Jan. 13, 2022



ANGELA N. HARVEY  
NOTARY PUBLIC OF NEW JERSEY  
ID No: 50052583  
My Commission Expires Jan. 13, 2022

ASSIGNMENT

WHEREAS I, **Zhu Liu** residing at **Marlboro, New Jersey** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled **“AUTOMATED LEARNING OF ANOMALIES IN MEDIA STREAMS WITH EXTERNAL FEED LABELS”** having AT&T Docket No. **2017-1273**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a **partnership** organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, Atlanta, Georgia, 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything

**PATENT**

possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 16th day of May, 2018.

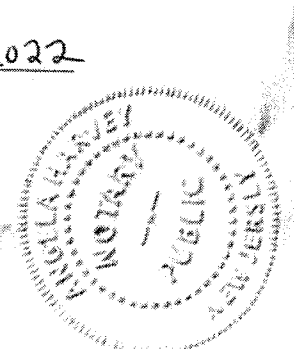
Zhu Liu  
Zhu Liu

State of New Jersey )  
County of Monmouth )

On this 16 day of May, 2018, before me a Notary Public in and for the above County and State, personally appeared **Zhu Liu**, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

Angela N. H  
Notary Public

My Commission Expires: Jan 13 2022



ANGELA N. HARVEY  
NOTARY PUBLIC OF NEW JERSEY  
ID No: 50052583  
My Commission Expires Jan. 13, 2022