

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5303789

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT

**CONVEYING PARTY DATA**

Name	Execution Date
JOHN BRIAN STEWART	09/20/2018
TIMOTHY ALAN CARNES	09/21/2018
LAHIRU SANDAKITH PILETHTHUWASAN GALLEGE	09/18/2018
CHRISTOPHER SEBASTIAN GROER	09/18/2018
CHENLU LOU	09/18/2018
DINESH PREMALARAL WEERAPURAGE	09/24/2018

**RECEIVING PARTY DATA**

<b>Name:</b>	MAPANYTHING, INC.
<b>Street Address:</b>	5200 77 CENTER DRIVE, SUITE 400
<b>City:</b>	CHARLOTTE
<b>State/Country:</b>	NORTH CAROLINA
<b>Postal Code:</b>	28217

**PROPERTY NUMBERS Total: 8**

Property Type	Number
Application Number:	16236642
Application Number:	16236643
Application Number:	16236644
Application Number:	16236645
Application Number:	16236650
Application Number:	16236652
Application Number:	16236653
Application Number:	16236654

**CORRESPONDENCE DATA**

**Fax Number:** (877)248-5100

*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:** 8772485100

**Email:** uspto@ti-law.com

**Correspondent Name:** TILLMAN WRIGHT, PLLC

**Address Line 1:** PO BOX 49309

PATENT

<b>Address Line 4:</b> CHARLOTTE, NORTH CAROLINA 28277	
<b>ATTORNEY DOCKET NUMBER:</b>	1240 CON APPS BATCH THREE
<b>NAME OF SUBMITTER:</b>	CHAD D TILLMAN
<b>SIGNATURE:</b>	/Chad D Tillman/
<b>DATE SIGNED:</b>	12/31/2018
	This document serves as an Oath/Declaration (37 CFR 1.63).
<b>Total Attachments: 30</b> source=Assignment#page1.tif source=Assignment#page2.tif source=Assignment#page3.tif source=Assignment#page4.tif source=Assignment#page5.tif source=Assignment#page6.tif source=Assignment#page7.tif source=Assignment#page8.tif source=Assignment#page9.tif source=Assignment#page10.tif source=Assignment#page11.tif source=Assignment#page12.tif source=Assignment#page13.tif source=Assignment#page14.tif source=Assignment#page15.tif source=Assignment#page16.tif source=Assignment#page17.tif source=Assignment#page18.tif source=Assignment#page19.tif source=Assignment#page20.tif source=Assignment#page21.tif source=Assignment#page22.tif source=Assignment#page23.tif source=Assignment#page24.tif source=Assignment#page25.tif source=Assignment#page26.tif source=Assignment#page27.tif source=Assignment#page28.tif source=Assignment#page29.tif source=Assignment#page30.tif	

## ASSIGNMENT OF INVENTION RIGHTS

WHEREAS,

Timothy Alan Carnes  
3033 23rd Ave W  
Seattle, WA 98199 US

(hereinafter "Assignor") has or may have invented certain new and useful improvements and/or designs (each hereinafter an "Invention" and collectively the "Inventions"), for a full description of which reference is here made to the following patent property:

Application No.: 16/053,789  
Titled: UTILIZING CONSTRAINTS AND PENALTIES TO FACILITATE DETERMINATION OF PREFERRED SOLUTIONS TO MULTI-OBJECTIVE ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

Application No.: 16/053,790  
Titled: UTILIZING ESTIMATED TRAVERSAL VALUES TO ACCELERATE THE DETERMINATION OF HIGH QUALITY SOLUTIONS TO ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

Application No.: 16/053,792  
Titled: UTILIZING A GEO-LOCATOR SERVICE AND ZONE SERVERS TO REDUCE COMPUTER RESOURCE REQUIREMENTS FOR DETERMINING HIGH QUALITY SOLUTIONS TO ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
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Application No.: 16/053,793  
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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

("Patent Property");

WHEREAS,

MAPANYTHING, INC.  
5200 77 Center Drive, Suite 400  
Charlotte, NC 28217 US

(hereinafter "Assignee") is desirous of acquiring all rights, title, and interests in, to, and under the Inventions and the Patent Property, and in, to, and under any patent that has been or may be obtained for any of the Inventions, together with all rights corresponding thereto;

NOW, THEREFORE, to all whom it may concern, be it known that, for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has agreed to irrevocably quitclaim, sell, assign, transfer and convey, and by these presents does hereby irrevocably quitclaim, sell, assign, transfer and convey, unto Assignee, *ab initio* and in perpetuity, all past, present and future right, title, and interest in, to and under:

- The Inventions;
- The right and authorization to file any application for any one or more of the Inventions;
- Any application for patent for any of the Inventions that may be or has been filed in any country, including the Patent Property;
- Any patent that may be or has been obtained for any of the Inventions in any country;
- Any reissue, reexamination, extension, renewal, substitution, conversion, confirmation, division, continuation, nonprovisional, provisional, continuation-in-part and the like of any of the foregoing;
- Any application claiming priority to any of the foregoing;
- Any application from which any of the foregoing claims priority; and
- Any past or present right or cause of action arising with respect to any of the foregoing, including any right to sue for patent infringement, and any copyright in any embodiment of an Invention including software, and any derivative right thereof,

(hereinafter collectively "Invention Rights").

FURTHERMORE,

Assignor hereby acknowledges that all of the Invention Rights related to any Invention were at least under obligations of assignment to Assignee at least as early as the time of conception of the Invention; that all Invention Rights related to any Invention already may have been assigned to Assignee; and that this "Prefiling Assignment of Invention Rights" (hereinafter "Assignment") is being duly executed for at least the purpose of public recordation with the U.S. Patent & Trademark Office of Assignee's rights, title, and interests in the Invention Rights.

Assignor hereby covenants and agrees, and binds all heirs, administrators, legal representatives, nominees, and assigns, to assist and cooperate with Assignee, at Assignee's expense, in the preparation and prosecution of any application included within the Invention Rights and in the prosecution or defense of any interference, opposition, or other proceeding or trial that may arise in connection with any application or patent included within the Invention Rights and, further, to execute and deliver to Assignee any petition, oath, assignment, or other paper or instrument that may be requested by Assignee in connection herewith, and Assignor hereby appoints the Assignee as its agent and attorney-in-fact to act for and on its behalf in connection with such actions, which appointment is irrevocable and coupled with an interest.

Effective with respect to each Invention at least as early as the time of conception of each such Invention, Assignor hereby authorizes and empowers Assignee to invoke and claim for any application or patent included within the Invention Rights the benefit of any rights to which Assignor might be entitled under international law or under the laws of any particular country, and to invoke and claim such rights without further written or oral authorization from Assignor.

Assignor hereby consents and agrees that a copy of this Assignment shall be deemed a full legal and formal equivalent of any assignment, consent to file, or like document that may be required in any particular country for any purpose and, more particularly, in proof of the right of Assignee to claim the aforesaid benefit of the right of priority and the right to file for patent.

Assignor covenants and agrees that this Assignment and all the terms thereof shall inure to the benefit of the successors, assigns, legal representatives, and nominees of Assignee, without further written or oral authorization from Assignor.

Assignor further hereby represents and warrants: that Assignor has the full power and authority to enter into this Assignment, to assign the Invention Rights, and to fully perform all of obligations of Assignor arising under this Assignment; and that there is no agreement between Assignor and any third party relating to any of the Invention Rights that conflicts with this Assignment.

Without limiting any of the foregoing, Assignor hereby waives any claim that may exist in any jurisdiction to "moral rights" or rights of "droit moral" with respect to any of the Invention Rights and agrees that Assignee shall have the right to make and shall own enhancements to and derivative works of any of the Invention Rights.

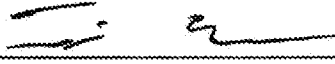
This Assignment is governed by and shall be construed in accordance with the laws of the State of North Carolina. To the extent one or more provisions of this Assignment are found invalid or unenforceable with respect to a particular national jurisdiction, the other provisions of this Assignment shall continue to apply in the particular national jurisdiction. Moreover, such finding in the particular national jurisdiction shall not affect the validity or enforceability of any provision of this Agreement in any other national jurisdiction.

[Signature Pages Follow]

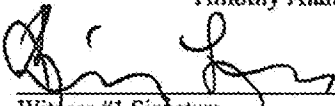
# ASSIGNOR SIGNATURE PAGE & DECLARATION FOR PATENT PROPERTY

Assignor further declares with respect to each application of the Patent Property both that he or she made such application or authorized such application to be made, and that such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application. Assignor hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than 5 years, or both.

This the 21<sup>st</sup> day of September, 2018.

Assignor  (seal)  
signature

Timothy Alan Carnes

  
Witness #1 Signature

Kimberly Leeper  
Witness #1 Name (print)

4819 49<sup>th</sup> Ave SW  
Witness #1 Address Line 1 Seattle, WA 98116

Witness #1 Address Line 2

  
Witness #2 Signature

Jessica Carnes  
Witness #2 Name (print)

3033 23<sup>rd</sup> Ave W  
Witness #2 Address Line 1

SEATTLE, WA 98199  
Witness #2 Address Line 2

## NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

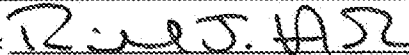
County of MECKLENBURG

United States of America

On this 21<sup>st</sup> day of SEPTEMBER, 2018.

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

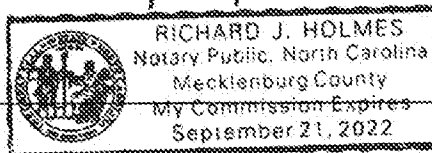
TIMOTHY ALAN CARNES (person appearing before notary)

Notary Signature: 

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)



ACCEPTANCE BY ASSIGNEE

Assignee hereby accepts the assignment of the Invention Rights as set forth above.

This the 24<sup>TH</sup> day of SEPTEMBER 2018.

MAPANYTHING, INC.

By: Richard J. ASH (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Michelle Tucker  
Witness #1 Signature

Michelle Tucker  
Witness #1 Name (print)

4018 Rosewood Lane  
Witness #1 Address Line 1

Indian Trail NC 28079  
Witness #1 Address Line 2

A. Canini  
Witness #2 Signature

Amanda Canilli  
Witness #2 Name (print)

4213 Town Center Rd  
Witness #2 Address Line 1

HARRISBURG, NC 28075  
Witness #2 Address Line 2

NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

County of MECKLENBURG

United States of America

On this 24<sup>th</sup> day of September, 2018

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: MEAGHAN SHUGHRUE

My Commission Expires: 10/25/2020

(Notary Seal)



## ASSIGNMENT OF INVENTION RIGHTS

WHEREAS,

Lahiru Sandakith Pileththuwasan Gallege  
9960 Coral Springs Lane  
Knoxville, TN 37922 US

(hereinafter "Assignor") has or may have invented certain new and useful improvements and/or designs (each hereinafter an "Invention" and collectively the "Inventions"), for a full description of which reference is here made to the following patent property:

Application No.: 16/053,789  
Titled: UTILIZING CONSTRAINTS AND PENALTIES TO FACILITATE DETERMINATION OF PREFERRED SOLUTIONS TO MULTI-OBJECTIVE ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

("Patent Property"):



WHEREAS,

MAPANYTHING, INC.  
5200 77 Center Drive, Suite 400  
Charlotte, NC 28217 US

(hereinafter "Assignee") is desirous of acquiring all rights, title, and interests in, to, and under the Inventions and the Patent Property, and in, to, and under any patent that has been or may be obtained for any of the Inventions, together with all rights corresponding thereto;

NOW, THEREFORE, to all whom it may concern, be it known that, for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has agreed to irrevocably quitclaim, sell, assign, transfer and convey, and by these presents does hereby irrevocably quitclaim, sell, assign, transfer and convey, unto Assignee, *ab initio* and in perpetuity, all past, present and future right, title, and interest in, to and under:

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- Any application for patent for any of the Inventions that may be or has been filed in any country, including the Patent Property;
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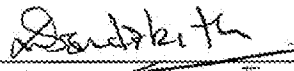
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[Signature Pages Follow]

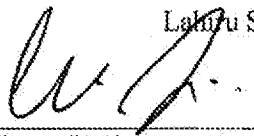
# ASSIGNOR SIGNATURE PAGE & DECLARATION FOR PATENT PROPERTY

Assignor further declares with respect to each application of the Patent Property both that he or she made such application or authorized such application to be made, and that such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application. Assignor hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than 5 years, or both.

This the 18<sup>th</sup> day of September, 2018.

Assignor  (seal)  
signature

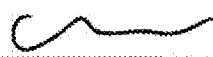
Lahiru Sandakith Pileththuwasan Gallege

  
Witness #1 Signature

CHRIS GROEN  
Witness #1 Name (print)

1811 RAVEN HILL CT.  
Witness #1 Address Line 1

KNOXVILLE, TN 37922  
Witness #1 Address Line 2

  
Witness #2 Signature

Chenlu Lou  
Witness #2 Name (print)

12733 Sailpointe Ln  
Witness #2 Address Line 1

KNOXVILLE, TN 37922  
Witness #2 Address Line 2

## NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

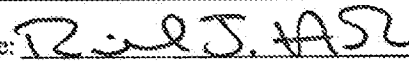
County of MECKLENBURG

United States of America

On this 18<sup>th</sup> day of SEPTEMBER, 2018,

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

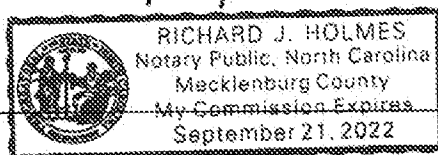
LAHIRU SANDAKITH PILETHTHUWASAN GALLEGE  
(person appearing before notary)

Notary Signature: 

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)



ACCEPTANCE BY ASSIGNEE

Assignee hereby accepts the assignment of the Invention Rights as set forth above.

This the 24<sup>th</sup> day of September, 2018.

MAPANYTHING, INC.

By: Richard J. ASR (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Michelle Tucker  
Witness #1 Signature

Michelle Tucker  
Witness #1 Name (print)

4018 Rosewater Lane  
Witness #1 Address Line 1

Indian Trail NC 28079  
Witness #1 Address Line 2

A. Carilli  
Witness #2 Signature

Amanda Carilli  
Witness #2 Name (print)

4213 Town Center Rd  
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Witness #2 Address Line 2

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County of Mecklenburg

United States of America

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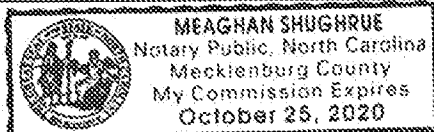
Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: Meaghan Shughrie

My Commission Expires: 10/25/2020

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Christopher Sebastian Groer  
1811 Raven Hill Court  
Knoxville, TN 37922 US

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- Any application for patent for any of the Inventions that may be or has been filed in any country, including the Patent Property;
- Any patent that may be or has been obtained for any of the Inventions in any country;
- Any reissue, reexamination, extension, renewal, substitution, conversion, confirmation, division, continuation, nonprovisional, provisional, continuation-in-part and the like of any of the foregoing;
- Any application claiming priority to any of the foregoing;
- Any application from which any of the foregoing claims priority; and
- Any past or present right or cause of action arising with respect to any of the foregoing, including any right to sue for patent infringement, and any copyright in any embodiment of an Invention including software, and any derivative right thereof,

(hereinafter collectively "Invention Rights").

FURTHERMORE,

Assignor hereby acknowledges that all of the Invention Rights related to any Invention were at least under obligations of assignment to Assignee at least as early as the time of conception of the Invention; that all Invention Rights related to any Invention already may have been assigned to Assignee; and that this "Prefiling Assignment of Invention Rights" (hereinafter "Assignment") is being duly executed for at least the purpose of public recordation with the U.S. Patent & Trademark Office of Assignee's rights, title, and interests in the Invention Rights.

Assignor hereby covenants and agrees, and binds all heirs, administrators, legal representatives, nominees, and assigns, to assist and cooperate with Assignee, at Assignee's expense, in the preparation and prosecution of any application included within the Invention Rights and in the prosecution or defense of any interference, opposition, or other proceeding or trial that may arise in connection with any application or patent included within the Invention Rights and, further, to execute and deliver to Assignee any petition, oath, assignment, or other paper or instrument that may be requested by Assignee in connection herewith, and Assignor hereby appoints the Assignee as its agent and attorney-in-fact to act for and on its behalf in connection with such actions, which appointment is irrevocable and coupled with an interest.

Effective with respect to each Invention at least as early as the time of conception of each such Invention, Assignor hereby authorizes and empowers Assignee to invoke and claim for any application or patent included within the Invention Rights the benefit of any rights to which Assignor might be entitled under international law or under the laws of any particular country, and to invoke and claim such rights without further written or oral authorization from Assignor.

Assignor hereby consents and agrees that a copy of this Assignment shall be deemed a full legal and formal equivalent of any assignment, consent to file, or like document that may be required in any particular country for any purpose and, more particularly, in proof of the right of Assignee to claim the aforesaid benefit of the right of priority and the right to file for patent.

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Assignor further hereby represents and warrants: that Assignor has the full power and authority to enter into this Assignment, to assign the Invention Rights, and to fully perform all of obligations of Assignor arising under this Assignment; and that there is no agreement between Assignor and any third party relating to any of the Invention Rights that conflicts with this Assignment.

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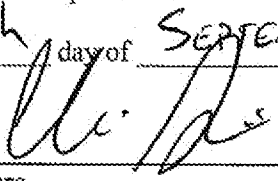
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[Signature Pages Follow]


# ASSIGNOR SIGNATURE PAGE & DECLARATION FOR PATENT PROPERTY

Assignor further declares with respect to each application of the Patent Property both that he or she made such application or authorized such application to be made, and that such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application. Assignor hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than 5 years, or both.

This the 18<sup>th</sup> day of SEPTEMBER, 2018.

Assignor  (seal)  
signature

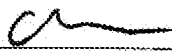
Christopher Sebastian Groer

  
Witness #1 Signature

Lahiru S. Pilelthumasan Gallege  
Witness #1 Name (print)

9960 Coral Springs Ln  
Witness #1 Address Line 1

Knoxville TN 37922  
Witness #1 Address Line 2

  
Witness #2 Signature

Chenlu Lou  
Witness #2 Name (print)

12733 Sailpointe Ln  
Witness #2 Address Line 1

KNOXVILLE, TN 37922  
Witness #2 Address Line 2

## NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

County of MECKLENBURG

United States of America

On this 18<sup>th</sup> day of SEPTEMBER, 2018.

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

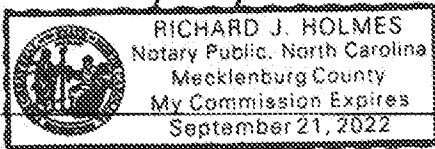
CHRISTOPHER SEBASTIAN GROER (person appearing before notary)

Notary Signature: 

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)





ACCEPTANCE BY ASSIGNEE

Assignee hereby accepts the assignment of the Invention Rights as set forth above.

This the 24<sup>th</sup> day of SEPTEMBER 2018

MAPANYTHING, INC.

By: Richard J. Holmes (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Michelle Tucker  
Witness #1 Signature

Michelle Tucker  
Witness #1 Name (print)

408 Redwood Lane  
Witness #1 Address Line 1

Indian Trail NC 28079  
Witness #1 Address Line 2

A. Carilli  
Witness #2 Signature

Amanda Carilli  
Witness #2 Name (print)

4213 Town Center Rd  
Witness #2 Address Line 1

HARRISBURG, NC 28075  
Witness #2 Address Line 2

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State of North Carolina

County of Mecklenburg

United States of America

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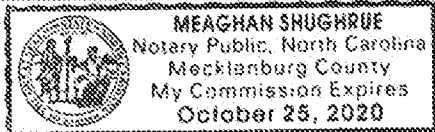
Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: Meaghan Shughrue

My Commission Expires: 10/25/2020

(Notary Seal)



## ASSIGNMENT OF INVENTION RIGHTS

WHEREAS,

Chenlu Lou  
12733 Sailpointe Lane  
Knoxville, TN 37922 US

(hereinafter "Assignor") has or may have invented certain new and useful improvements and/or designs (each hereinafter an "Invention" and collectively the "Inventions"), for a full description of which reference is here made to the following patent property:

Application No.: 16/053,789  
Titled: UTILIZING CONSTRAINTS AND PENALTIES TO FACILITATE DETERMINATION OF PREFERRED SOLUTIONS TO MULTI-OBJECTIVE ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

Application No.: 16/053,790  
Titled: UTILIZING ESTIMATED TRAVERSAL VALUES TO ACCELERATE THE DETERMINATION OF HIGH QUALITY SOLUTIONS TO ROUTING PROBLEMS  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

Application No.: 16/053,792  
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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

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Titled: UTILIZING DETERMINED OPTIMIZED TIME WINDOWS FOR PRECOMPUTING OPTIMAL PATH MATRICES TO REDUCE COMPUTER RESOURCE USAGE  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

("Patent Property");

WHEREAS,

MAPANYTHING, INC.  
5200 77 Center Drive, Suite 400  
Charlotte, NC 28217 US

(hereinafter "Assignee") is desirous of acquiring all rights, title, and interests in, to, and under the Inventions and the Patent Property, and in, to, and under any patent that has been or may be obtained for any of the Inventions, together with all rights corresponding thereto;

NOW, THEREFORE, to all whom it may concern, be it known that, for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has agreed to irrevocably quitclaim, sell, assign, transfer and convey, and by these presents does hereby irrevocably quitclaim, sell, assign, transfer and convey, unto Assignee, *ab initio* and in perpetuity, all past, present and future right, title, and interest in, to and under:

- The Inventions;
- The right and authorization to file any application for any one or more of the Inventions;
- Any application for patent for any of the Inventions that may be or has been filed in any country, including the Patent Property;
- Any patent that may be or has been obtained for any of the Inventions in any country;
- Any reissue, reexamination, extension, renewal, substitution, conversion, confirmation, division, continuation, nonprovisional, provisional, continuation-in-part and the like of any of the foregoing;
- Any application claiming priority to any of the foregoing;
- Any application from which any of the foregoing claims priority; and
- Any past or present right or cause of action arising with respect to any of the foregoing, including any right to sue for patent infringement, and any copyright in any embodiment of an Invention including software, and any derivative right thereof,

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[Signature Pages Follow]


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This the 18<sup>th</sup> day of September, 2018.

Assignor  (seal)  
signature

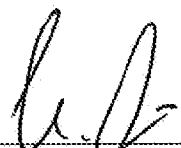
Chenlu Lou

  
Witness #1 Signature

Lahiru S. Pileththanasunjalage  
Witness #1 Name (print)

9960 Coral Springs Ln  
Witness #1 Address Line 1

Knoxville TN 37922  
Witness #1 Address Line 2

  
Witness #2 Signature

CHRIS GRUEN  
Witness #2 Name (print)

1811 RAVEN HILL CT.  
Witness #2 Address Line 1

KNOXVILLE, TN 37922  
Witness #2 Address Line 2

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County of MECKLENBURG

United States of America

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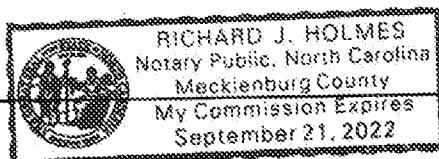
CHENLU LOU (person appearing before notary)

Notary Signature: 

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)



ACCEPTANCE BY ASSIGNEE

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MAPANYTHING, INC.

By: Richard J. Holmes (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Michelle Tucker  
Witness #1 Signature

Michelle Tucker  
Witness #1 Name (print)

4013 Rosewater Lane  
Witness #1 Address Line 1

Indian Trail, NC 28079  
Witness #1 Address Line 2

Amanda Carilli  
Witness #2 Signature

Amanda Carilli  
Witness #2 Name (print)

4213 Town Center Rd  
Witness #2 Address Line 1

Harrisburg, NC 28075  
Witness #2 Address Line 2

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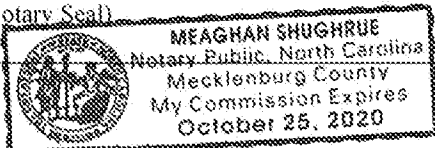
Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: Meaghan Shughrue

My Commission Expires: 10/25/2020

(Notary Seal)



## ASSIGNMENT OF INVENTION RIGHTS

WHEREAS,

John Brian Stewart  
4709 Noras Path Road  
Charlotte, NC 28226 US

(hereinafter "Assignor") has or may have invented certain new and useful improvements and/or designs (each hereinafter an "Invention" and collectively the "Inventions"), for a full description of which reference is here made to the following patent property:

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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

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Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
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("Patent Property");

WHEREAS,

MAPANYTHING, INC.  
5200 77 Center Drive, Suite 400  
Charlotte, NC 28217 US

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NOW, THEREFORE, to all whom it may concern, be it known that, for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has agreed to irrevocably quitclaim, sell, assign, transfer and convey, and by these presents does hereby irrevocably quitclaim, sell, assign, transfer and convey, unto Assignee, *ab initio* and in perpetuity, all past, present and future right, title, and interest in, to and under:

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[Signature Pages Follow]

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This the 20<sup>th</sup> day of September 2018.

Assignor [Signature] (seal)  
signature

John Brian Stewart

[Signature]  
Witness #1 Signature

Michelle Tucker  
Witness #1 Name (print)

4018 Rosewater Lane  
Witness #1 Address Line 1

Indian Trail, NC 28079  
Witness #1 Address Line 2

[Signature]  
Witness #2 Signature

Amanda Carilli  
Witness #2 Name (print)

4213 Town Center Rd  
Witness #2 Address Line 1

HARRISBURG, NC 28075  
Witness #2 Address Line 2

## NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

County of MECKLENBURG

United States of America

On this 20<sup>th</sup> day of SEPTEMBER, 2018.

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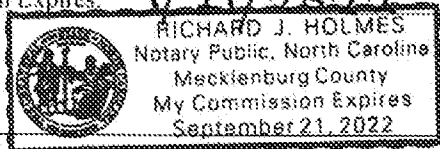
JOHN BRIAN STEWART (person appearing before notary)

Notary Signature: [Signature]

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)



ACCEPTANCE BY ASSIGNEE

Assignee hereby accepts the assignment of the Invention Rights as set forth above.

This the 24<sup>th</sup> day of September 2018

MAPANYTHING, INC.

By: Richard J. Holmes (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Michelle Turner  
Witness #1 Signature

Michelle Turner  
Witness #1 Name (print)

4012 Rosewater Lane  
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Witness #1 Address Line 2

A. Carini  
Witness #2 Signature

Amanda Carilli  
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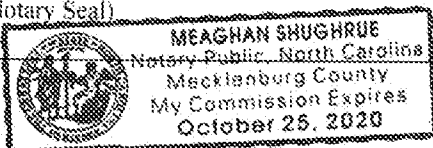
Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: Meaghan Shughrue

My Commission Expires: 10/25/2020

(Notary Seal)



## ASSIGNMENT OF INVENTION RIGHTS

WHEREAS,

Dinesh Premalal Weerapurage  
13806 W Layton Cir  
Morrison, CO 80465 US

(hereinafter "Assignor") has or may have invented certain new and useful improvements and/or designs (each hereinafter an "Invention" and collectively the "Inventions"), for a full description of which reference is here made to the following patent property:

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Application No.: 16/053,793  
Titled: UTILIZING DETERMINED OPTIMIZED TIME WINDOWS FOR PRECOMPUTING OPTIMAL PATH MATRICES TO REDUCE COMPUTER RESOURCE USAGE  
Inventors: John Brian Stewart, Dinesh Premalal Weerapurage, Timothy Alan Carnes, Christopher Sebastian Groer, Lahiru Sandakith Pileththuwasan Gallege, Chenlu Lou  
Filed on: August 2, 2018

("Patent Property");

WHEREAS,

MAPANYTHING, INC.  
5200 77 Center Drive, Suite 400  
Charlotte, NC 28217 US

(hereinafter "Assignee") is desirous of acquiring all rights, title, and interests in, to, and under the Inventions and the Patent Property, and in, to, and under any patent that has been or may be obtained for any of the Inventions, together with all rights corresponding thereto;

NOW, THEREFORE, to all whom it may concern, be it known that, for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has agreed to irrevocably quitclaim, sell, assign, transfer and convey, and by these presents does hereby irrevocably quitclaim, sell, assign, transfer and convey, unto Assignee, *ab initio* and in perpetuity, all past, present and future right, title, and interest in, to and under:

- The Inventions;
- The right and authorization to file any application for any one or more of the Inventions;
- Any application for patent for any of the Inventions that may be or has been filed in any country, including the Patent Property;
- Any patent that may be or has been obtained for any of the Inventions in any country;
- Any reissue, reexamination, extension, renewal, substitution, conversion, confirmation, division, continuation, nonprovisional, provisional, continuation-in-part and the like of any of the foregoing;
- Any application claiming priority to any of the foregoing;
- Any application from which any of the foregoing claims priority; and
- Any past or present right or cause of action arising with respect to any of the foregoing, including any right to sue for patent infringement, and any copyright in any embodiment of an Invention including software, and any derivative right thereof,

(hereinafter collectively "Invention Rights").

FURTHERMORE,

Assignor hereby acknowledges that all of the Invention Rights related to any Invention were at least under obligations of assignment to Assignee at least as early as the time of conception of the Invention; that all Invention Rights related to any Invention already may have been assigned to Assignee; and that this "Prefiling Assignment of Invention Rights" (hereinafter "Assignment") is being duly executed for at least the purpose of public recordation with the U.S. Patent & Trademark Office of Assignee's rights, title, and interests in the Invention Rights.

Assignor hereby covenants and agrees, and binds all heirs, administrators, legal representatives, nominees, and assigns, to assist and cooperate with Assignee, at Assignee's expense, in the preparation and prosecution of any application included within the Invention Rights and in the prosecution or defense of any interference, opposition, or other proceeding or trial that may arise in connection with any application or patent included within the Invention Rights and, further, to execute and deliver to Assignee any petition, oath, assignment, or other paper or instrument that may be requested by Assignee in connection herewith, and Assignor hereby appoints the Assignee as its agent and attorney-in-fact to act for and on its behalf in connection with such actions, which appointment is irrevocable and coupled with an interest.

Effective with respect to each Invention at least as early as the time of conception of each such Invention, Assignor hereby authorizes and empowers Assignee to invoke and claim for any application or patent included within the Invention Rights the benefit of any rights to which Assignor might be entitled under international law or under the laws of any particular country, and to invoke and claim such rights without further written or oral authorization from Assignor.

Assignor hereby consents and agrees that a copy of this Assignment shall be deemed a full legal and formal equivalent of any assignment, consent to file, or like document that may be required in any particular country for any purpose and, more particularly, in proof of the right of Assignee to claim the aforesaid benefit of the right of priority and the right to file for patent.

Assignor covenants and agrees that this Assignment and all the terms thereof shall inure to the benefit of the successors, assigns, legal representatives, and nominees of Assignee, without further written or oral authorization from Assignor.

Assignor further hereby represents and warrants: that Assignor has the full power and authority to enter into this Assignment, to assign the Invention Rights, and to fully perform all of obligations of Assignor arising under this Assignment; and that there is no agreement between Assignor and any third party relating to any of the Invention Rights that conflicts with this Assignment.

Without limiting any of the foregoing, Assignor hereby waives any claim that may exist in any jurisdiction to "moral rights" or rights of "droit moral" with respect to any of the Invention Rights and agrees that Assignee shall have the right to make and shall own enhancements to and derivative works of any of the Invention Rights.

This Assignment is governed by and shall be construed in accordance with the laws of the State of North Carolina. To the extent one or more provisions of this Assignment are found invalid or unenforceable with respect to a particular national jurisdiction, the other provisions of this Assignment shall continue to apply in the particular national jurisdiction. Moreover, such finding in the particular national jurisdiction shall not affect the validity or enforceability of any provision of this Agreement in any other national jurisdiction.

[Signature Pages Follow]

# ASSIGNOR SIGNATURE PAGE & DECLARATION FOR PATENT PROPERTY

Assignor further declares with respect to each application of the Patent Property both that he or she made such application or authorized such application to be made, and that such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application. Assignor hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than 5 years, or both.

This the 24<sup>th</sup> day of September, 2018

Assignor [Signature] (seal)  
signature

Dinesh Premalal Weerapugage

[Signature]  
Witness #1 Signature

NETHIKA SURANEERA  
Witness #1 Name (print)

13806 K Layton Cir  
Witness #1 Address Line 1

Morrisen CO 28045  
Witness #1 Address Line 2

[Signature]  
Witness #2 Signature

Methan Mugnall  
Witness #2 Name (print)

1420 Abbey Pl, 313  
Witness #2 Address Line 1

Charlotte NC 28209  
Witness #2 Address Line 2

## NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of NORTH CAROLINA

County of MECKLENBURG

United States of America

On this 24<sup>th</sup> day of SEPTEMBER, 2018

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

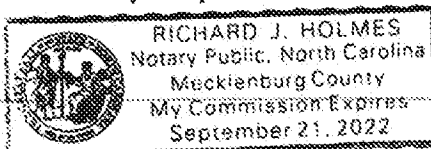
DINESH PREMALAR WEERAPUGAGE (person appearing before notary)

Notary Signature: [Signature]

Printed Name: RICHARD J. HOLMES

My Commission Expires: 9/21/2022

(Notary Seal)



ACCEPTANCE BY ASSIGNEE

Assignee hereby accepts the assignment of the Invention Rights as set forth above.

This the 25<sup>th</sup> day of SEPTEMBER, 2018.

MAPANYTHING, INC.

By: Richard J. Holmes (seal)  
signature

RICHARD J. HOLMES  
printed name

CORPORATE SECRETARY  
title

Amanda Cakilli  
Witness #1 Signature

Amanda Cakilli  
Witness #1 Name (print)

4213 Town Center Rd  
Witness #1 Address Line 1

HARRISBURG, NC 28075  
Witness #1 Address Line 2

Chantel Duncan  
Witness #2 Signature

Chantel Duncan  
Witness #2 Name (print)

1009 Bailes Ridge Ave  
Witness #2 Address Line 1

Fort Mill, SC, 29707  
Witness #2 Address Line 2

NOTARY CERTIFICATE FOR ACKNOWLEDGEMENT

State of North Carolina

County of Mecklenburg

United States of America

On this 25<sup>th</sup> day of September, 2018

I certify that the following person personally appeared before me and acknowledged to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated:

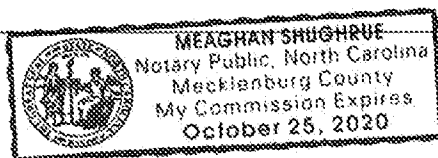
Richard Holmes (person appearing before notary)

Notary Signature: [Signature]

Printed Name: MEAGHAN SHUGRUE

My Commission Expires: 10/25/2020

(Notary Seal)



5 of 5