

PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

EPAS ID: PAT6148319

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
JOSÉ M.F. MOURA	04/06/2018
SHANGHANG ZHANG	04/04/2018
EVGENY TOROPOV	04/04/2018
RECEIVING PARTY DATA	
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State/Country:	PENNSYLVANIA
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PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	16898508
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ATTORNEY DOCKET NUMBER:	16985-001USC1
NAME OF SUBMITTER:	MORGAN S. HELLER II
SIGNATURE:	/Morgan S. Heller II/
DATE SIGNED:	06/11/2020
Total Attachments: 3	
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source=AssignmentsCMU_16985001USC1#page2.tif	
source=AssignmentsCMU_16985001USC1#page3.tif	

ASSIGNMENT

Whereas, I, **José M. F. Moura**, residing in **Pittsburgh, PA**, have invented one or more new and useful inventions and have filed International Patent Application No.: PCT/US18/ 26341, on April 5, 2018, entitled "Deep Learning Methods For Estimating Density and/or Flow of Objects, and Related Methods and Software", and U.S. Provisional Patent application No. 62/601,953, filed on April 5, 2017, entitled "Extract Urban Traffic Information From Citywide Infrastructure Sensors To Augment Autonomous Intelligent System" (hereinafter, "Application(s)");

And whereas, Carnegie Mellon University, a Pennsylvania Non-Profit Corporation, having a place of business at 5000 Forbes Avenue, Pittsburgh, PA 15213 (hereinafter, "Assignee"), desires to acquire the entire right, title and interest in the Application(s) and all inventions disclosed therein, and to any United States and foreign patents to be obtained therefor, and to any United States, international, and foreign patent applications to be filed thereon;

Now therefore, for good and valuable consideration, receipt whereof is hereby acknowledged, I, the above-named inventor hereby sell, assign, and transfer to Assignee, its successors and assigns, and confirm any previous assignments made by me for, the entire right, title and interest in the Application(s) and inventions therein disclosed for the United States and foreign countries, including all provisional applications relating thereto, all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents which may have been granted or may be granted hereafter thereon, and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon, and all rights of priority resulting from any of the foregoing.

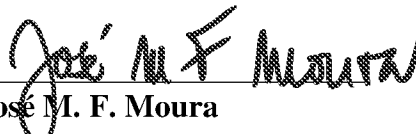
And I hereby agree that Assignee may file one or more international applications and apply for foreign Letters Patent on said inventions; and I request the Commissioner for Patents of the United States Patent and Trademark Office and the authorized official in each respective foreign patent office to issue any Letters Patent granted upon the inventions set forth in the Application(s) to Assignee; and I will execute all papers necessary in connection with the United States, international, and foreign applications when called upon to do so by Assignee.

I, the above-named, hereby covenant that no assignment, sale, agreement, or encumbrance has been or will be made or entered into which would conflict with this Assignment.

I hereby authorize Downs Rachlin Martin PLLC to insert into this Assignment in the blank spaces appearing above, respectively, the application serial number of the patent application identified by Attorney Docket No. "16985-001WOU1" which appears on at least one page of the application.

Executed at New York (city/town), NY (state/country),

this 6 day of April, 2018.



José M. F. Moura

18227673.1

ASSIGNMENT

Whereas, I, **Shanghang Zhang**, residing in **Pittsburgh, PA**, have invented one or more new and useful inventions and have filed International Patent Application No.: PCT/US18/ 26341, on April 5, 2018, entitled "Deep Learning Methods For Estimating Density and/or Flow of Objects, and Related Methods and Software", and U.S. Provisional Patent application No. 62/601,953, filed on April 5, 2017, entitled "Extract Urban Traffic Information From Citywide Infrastructure Sensors To Augment Autonomous Intelligent System" (hereinafter, "Application(s)");

And whereas, Carnegie Mellon University, a Pennsylvania Non-Profit Corporation, having a place of business at 5000 Forbes Avenue, Pittsburgh, PA 15213 (hereinafter, "Assignee"), desires to acquire the entire right, title and interest in the Application(s) and all inventions disclosed therein, and to any United States and foreign patents to be obtained therefor, and to any United States, international, and foreign patent applications to be filed thereon;

Now therefore, for good and valuable consideration, receipt whereof is hereby acknowledged, I, the above-named inventor hereby sell, assign, and transfer to Assignee, its successors and assigns, and confirm any previous assignments made by me for, the entire right, title and interest in the Application(s) and inventions therein disclosed for the United States and foreign countries, including all provisional applications relating thereto, all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents which may have been granted or may be granted hereafter thereon, and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon, and all rights of priority resulting from any of the foregoing.

And I hereby agree that Assignee may file one or more international applications and apply for foreign Letters Patent on said inventions; and I request the Commissioner for Patents of the United States Patent and Trademark Office and the authorized official in each respective foreign patent office to issue any Letters Patent granted upon the inventions set forth in the Application(s) to Assignee; and I will execute all papers necessary in connection with the United States, international, and foreign applications when called upon to do so by Assignee.

I, the above-named, hereby covenant that no assignment, sale, agreement, or encumbrance has been or will be made or entered into which would conflict with this Assignment.

I hereby authorize Downs Rachlin Martin PLLC to insert into this Assignment in the blank spaces appearing above, respectively, the application serial number of the patent application identified by Attorney Docket No. "16985-001WOU1" which appears on at least one page of the application.

Executed at Pittsburgh (city/town), PA/US (state/country),
 this 4 day of April, 2018.
Shanghang Zhang
 Shanghang Zhang

18227675.1

ASSIGNMENT

Whereas, I, **Evgeny Toropov**, residing in **Pittsburgh, PA**, have invented one or more new and useful inventions and have filed International Patent Application No.: PCT/US18/ 26341, on April 5, 2018, entitled "Deep Learning Methods For Estimating Density and/or Flow of Objects, and Related Methods and Software", and U.S. Provisional Patent application No. 62/601,953, filed on April 5, 2017, entitled "Extract Urban Traffic Information From Citywide Infrastructure Sensors To Augment Autonomous Intelligent System" (hereinafter, "Application(s)");

And whereas, Carnegie Mellon University, a Pennsylvania Non-Profit Corporation, having a place of business at 5000 Forbes Avenue, Pittsburgh, PA 15213 (hereinafter, "Assignee"), desires to acquire the entire right, title and interest in the Application(s) and all inventions disclosed therein, and to any United States and foreign patents to be obtained therefor, and to any United States, international, and foreign patent applications to be filed thereon;

Now therefore, for good and valuable consideration, receipt whereof is hereby acknowledged, I, the above-named inventor hereby sell, assign, and transfer to Assignee, its successors and assigns, and confirm any previous assignments made by me for, the entire right, title and interest in the Application(s) and inventions therein disclosed for the United States and foreign countries, including all provisional applications relating thereto, all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents which may have been granted or may be granted hereafter thereon, and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon, and all rights of priority resulting from any of the foregoing.

And I hereby agree that Assignee may file one or more international applications and apply for foreign Letters Patent on said inventions; and I request the Commissioner for Patents of the United States Patent and Trademark Office and the authorized official in each respective foreign patent office to issue any Letters Patent granted upon the inventions set forth in the Application(s) to Assignee; and I will execute all papers necessary in connection with the United States, international, and foreign applications when called upon to do so by Assignee.

I, the above-named, hereby covenant that no assignment, sale, agreement, or encumbrance has been or will be made or entered into which would conflict with this Assignment.

I hereby authorize Downs Rachlin Martin PLLC to insert into this Assignment in the blank spaces appearing above, respectively, the application serial number of the patent application identified by Attorney Docket No. "16985-001WOU1" which appears on at least one page of the application.

Executed at Pittsburgh (city/town), PA, USA (state/country),
this 4 day of April, 2018.



Evgeny Toropov

18227678.1