

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

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|---|---------------------------|
| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | ASSIGNMENT |
| CONVEYING PARTY DATA | |
| Name | Execution Date |
| RICHARD LINDERMAN | 07/08/2014 |
| QING WU | 07/10/2014 |
| GARRETT ROSE | 07/18/2014 |
| HAI LI | 08/19/2014 |
| YIRAN CHEN | 09/03/2014 |
| MIAO HU | 06/18/2014 |
| RECEIVING PARTY DATA | |
| Name: | United States Air Force |
| Street Address: | 26 Electronic Parkway |
| Internal Address: | AFRL/RIJ |
| City: | Rome |
| State/Country: | NEW YORK |
| Postal Code: | 13441-4514 |
| PROPERTY NUMBERS Total: 1 | |
| Property Type | Number |
| Application Number: | 14328043 |
| CORRESPONDENCE DATA | |
| Fax Number: | (315)330-7583 |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> | |
| Phone: | 315.330.2087 |
| Email: | Judith.Decker@us.af.mil |
| Correspondent Name: | AFRL/RIJ |
| Address Line 1: | 26 ELECTRONIC PARKWAY |
| Address Line 4: | ROME, NEW YORK 13441-4514 |
| ATTORNEY DOCKET NUMBER: | RL10138 |
| NAME OF SUBMITTER: | JUDITH M. DECKER |
| SIGNATURE: | /JMD/ |
| DATE SIGNED: | 06/21/2017 |

Total Attachments: 6

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ASSIGNMENT
of
GOVERNMENT EMPLOYEE
INVENTION AND PATENT RIGHTS, TITLE & INTERESTS

WHEREAS Richard Linderman, Qing Wu, and Garrett Rose, employees of the United States Government made an invention jointly with Hai Li, Yiran Chen, and Miao Hu, entitled, METHOD AND APPARATUS FOR PERFORMING CLOSE-LOOP PROGRAMMING OF RESISTIVE MEMORY DEVICES IN CROSSBAR ARRAY BASED HARDWARE CIRCUITS AND SYSTEMS and being first disclosed and described in application for Letters Patent of the United States executed by us on 7/10/2014 and filed on 7/10/2014, 2014, as U.S. Patent Application No. 14/322,043, which invention forms a part of the aforesaid agreement;

NOW, THEREFORE, to all whom it may concern, be it known that for and in consideration of the premises and other valuable considerations, we, Richard Linderman, Qing Wu, and Garrett Rose, co-inventors, have sold, assigned, and transferred, and by these presents do sell, assign, and transfer unto the said Government of the United States, as represented by the Secretary of the Air Force, our undivided right, title and interest throughout the United States of America, its territories and dependencies, and all foreign countries, in and to the aforesaid invention described in the aforesaid application for Letters Patent of the United States, entitled, METHOD AND APPARATUS FOR PERFORMING CLOSE-LOOP PROGRAMMING OF RESISTIVE MEMORY DEVICES IN CROSSBAR ARRAY BASED HARDWARE CIRCUITS AND SYSTEMS and all Letters Patent issuing there on and any continuations, divisions and reissues or extensions thereof; we do hereby authorize and request the Commissioner of Patents to issue the said Letters Patent to the Government of the United States of America, as represented by the Secretary of the Air Force and his/her successors, the assignee of said undivided right, title, and interest in and to the same for the sole use, except as aforesaid, for the full term or terms for which said Letters Patent and any continuations, divisions, and reissues or extensions thereof are or may be granted as fully and entirely except as aforesaid, as the same would have been held by us had this assignment not been made; and we, Richard Linderman, Qing Wu, and Garrett Rose, do hereby agree to execute any and all applications for Letters Patent, both domestic and foreign, and to furnish all data and documents and to execute any papers which may be necessary for the preparation or filing of such applications, except it shall be understood that we, Richard Linderman, Qing Wu, and Garrett Rose shall not be subject to any out-of-pocket expenses relative to such action.

Inventor Richard W. Linderman
Richard Linderman

STATE OF NEW YORK

SS:

COUNTY OF ONEIDA

Before me, a Notary Public in and for the county of Oneida and state of New York, on this 8th day of July, 2014, personally appeared Richard Linderman, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.

(Seal)

JOSEPH A. MANCINI
NOTARY PUBLIC, State of New York
No. 02MA6072019
Appointed in Oneida County
Commission Expires 25 Mar 2018

[Signature]
Notary Public

Inventor Qing Wu
Qing Wu

STATE OF NEW YORK

SS:

COUNTY OF ONEIDA

Before me, a Notary Public in and for the county of Oneida and state of New York, on this 10th day of July, 2014, personally appeared Qing Wu, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.

(Seal) JOSEPH A. MANCINI
NOTARY PUBLIC, State of New York
No. 02MA6072019
Appointed in Oneida County
Commission Expires 25 Mar 2018

[Signature]
Notary Public

Inventor Garrett Rose
Garrett Rose

STATE OF NEW YORK

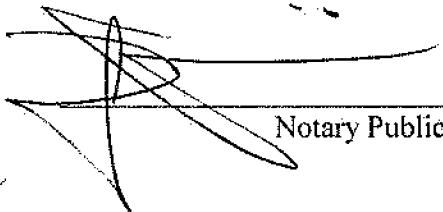
ss:

COUNTY OF ONEIDA

Before me, a Notary Public in and for the county of Oneida and state of New York, on this 18th day of JUNE, 2014, personally appeared Garrett Rose, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.

(Seal)


JOSEPH A. MANCINI
NOTARY PUBLIC, State of New York
No. 02MA6072019
Appointed in Oneida County
Commission Expires 25 Mar 2015


Notary Public

ASSIGNMENT
of
INVENTION AND PATENT RIGHTS, TITLE & INTERESTS

WHEREAS, Hai Li, Yiran Chen, and Miao Hu, made an invention jointly with employees of the United States Government Richard Linderman, Qing Wu, and Garrett Rose, entitled, METHOD AND APPARATUS FOR PERFORMING CLOSE-LOOP PROGRAMMING OF RESISTIVE MEMORY DEVICES IN CROSSBAR ARRAY BASED HARDWARE CIRCUITS AND SYSTEMS and being first disclosed and described in application for Letters Patent of the United States executed by us on 6/23/2014 and filed on 7/10/2014, 2014, as U.S. Patent Application No. 14/323,043, which invention forms a part of the aforesaid agreement;

NOW, THEREFORE, to all whom it may concern, be it known that for and in consideration of the premises and other valuable considerations, we, Hai Li, Yiran Chen, and Miao Hu, co-inventors, have sold, assigned, and transferred, and by these presents do sell, assign, and transfer unto the said Government of the United States, as represented by the Secretary of the Air Force, our undivided right, title and interest throughout the United States of America, its territories and dependencies, and all foreign countries, in and to the aforesaid invention described in the aforesaid application for Letters Patent of the United States, entitled, METHOD AND APPARATUS FOR PERFORMING CLOSE-LOOP PROGRAMMING OF RESISTIVE MEMORY DEVICES IN CROSSBAR ARRAY BASED HARDWARE CIRCUITS AND SYSTEMS and all Letters Patent issuing there on and any continuations, divisions and reissues or extensions thereof; we do hereby authorize and request the Commissioner of Patents to issue the said Letters Patent to the Government of the United States of America, as represented by the Secretary of the Air Force and his/her successors, the assignee of said undivided right, title, and interest in and to the same for the sole use, except as aforesaid, for the full term or terms for which said Letters Patent and any continuations, divisions, and reissues or extensions thereof are or may be granted as fully and entirely except as aforesaid, as the same would have been held by us had this assignment not been made; and we, Hai Li, Yiran Chen, and Miao Hu, do hereby agree to execute any and all applications for Letters Patent, both domestic and foreign, and to furnish all data and documents and to execute any papers which may be necessary for the preparation or filing of such applications, except it shall be understood that we, Hai Li, Yiran Chen, and Miao Hu shall not be subject to any out-of-pocket expenses relative to such action.

Inventor 
Hai Li

STATE OF Pennsylvania
COUNTY OF Allegheny ss:

Before me, a Notary Public in and for the county of Allegheny and state of Pennsylvania, on this 23 day of August, 2014, personally appeared Hai Li, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.

COMMONWEALTH OF PENNSYLVANIA
(Seal) Notarial Seal
Paul C. Kalknot, Notary Public
Ross Twp., Allegheny County
My Commission Expires Oct. 6, 2017
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES



Notary Public

Inventor 
Yiran Chen

STATE OF Pennsylvania
COUNTY OF Allegheny ss:

Before me, a Notary Public in and for the county of Allegheny and state of Pennsylvania, on this 3rd day of September, 2014, personally appeared Yiran Chen, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.

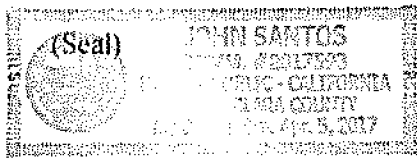
COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Michael T. Cannon, Notary Public
City of Pittsburgh, Allegheny County
My Commission Expires March 5, 2017
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES


Notary Public

Inventor Miao Hu
Miao Hu

STATE OF California
COUNTY OF Santa Clara ss:

Before me, a Notary Public in and for the county of Santa Clara and state of California, on this 18th day of June, 2014, personally appeared Miao Hu, who being duly sworn did say that he is the inventor who signed the above Assignment to be his free act and deed.



John Santos
Notary Public