

PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

EPAS ID: PAT6608438

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
FAN ZHANG	03/18/2021
AMAN BHATIA	01/23/2021
HAOBO WANG	01/25/2021
MEYSAM ASADI	01/22/2021
RECEIVING PARTY DATA	
Name:	SK HYNIX INC.
Street Address:	2091, GYEONGCHUNG-DAERO, BUBAL-EUB, GYEONGGI-DO
City:	ICHEON-SI
State/Country:	KOREA, REPUBLIC OF
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	17147770
CORRESPONDENCE DATA	
Fax Number:	
<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>	
Email:	patentprocurement@perkinscoie.com, jajones@perkinscoie.com, jcoyman@perkinscoie.com
Correspondent Name:	PERKINS COIE LLP - SDO GENERAL
Address Line 1:	PO BOX 1247
Address Line 4:	SEATTLE, WASHINGTON 98111-1247
ATTORNEY DOCKET NUMBER:	088453-8819.US00
NAME OF SUBMITTER:	JILL COYMAN
SIGNATURE:	/JILL COYMAN/
DATE SIGNED:	03/18/2021
This document serves as an Oath/Declaration (37 CFR 1.63).	
Total Attachments: 16	
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Fan Zhang et al.

Application No.: 17/147,770

Filed: January 13, 2021

For: GAUSSIAN MODELING FOR SOFT-READ
THRESHOLD ESTIMATION IN NON-VOLATILE
MEMORY DEVICES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION AND ASSIGNMENT BY THE INVENTOR
UNDER RULE 37 C.F.R. § 1.63 EFFECTIVE ON SEPTEMBER 16, 2012**

I, Fan Zhang, of Fremont, CA, hereby declare that:

I believe I am the sole original inventor or an original joint inventor of a claimed invention in a patent application entitled:

**GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-
VOLATILE MEMORY DEVICES**

the specification of which is attached hereto and identified as Attorney Docket No. 088453-8819.US00.

I believe the following persons are additional original joint inventors of the above-identified patent application:

Aman Bhatia, of San Jose, CA;

Haobo Wang, of San Jose, CA; and

Meysam Asadi, of Fremont, CA.

I made, authorized to make, or hereby make or authorize to make the above-identified patent application at the U.S. Patent and Trademark Office.

I have reviewed and understand the contents of the above-identified patent application including the claims.

I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby acknowledge that any willful false statement made in the above declaration is punishable under 18 USC §1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

I hereby assign to SK hynix Inc., a corporation of Republic of Korea, having a place of business at 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-Do, Republic of Korea, and its successors and assigns (collectively hereinafter called “the Assignee”), the entire right, title and interest throughout the world in any and all inventions and improvements which are described in an application for United States Patent filed by me, entitled *GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-VOLATILE MEMORY DEVICES*, filed on January 13, 2021, and assigned U.S. Application Number 17/147,770. I authorize and request an attorney appointed in said application to hereafter insert above the filing date and application number of said application when known.

This assignment includes the entire right, title and interest in said application, all legal equivalents thereof in any country, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions and improvements, including, but not limited to, all divisions, continuations, reissues, reexamination certificates, any and all certificates issued in any post-grant proceeding, and extensions of said applications and patents of the United States, foreign patents, utility models, and design registrations, and the right to claim priority based on the filing date of said application under the International Convention for

the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes, and the right to seek relief and recover all damages, including, but not limited to, a reasonable royalty, by reason of infringement or any other violation of patent or patent application rights. I authorize the Assignee to apply in all countries in my name or in the name of the Assignee for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements.

In addition, I hereby confirm the sale, assignment, and transfer to the Assignee of the entire right, title and interest throughout the world in said inventions and improvements that occurred by operation of an employment agreement between me and the Assignee existing at the time said inventions and improvements were made. Should I have any remaining interest, I hereby sell, assign, and transfer any right, title and interest I may have in said inventions and improvements anywhere in the world to the Assignee.

The foregoing assignments, sale and transfer have been made for good and valuable consideration, the receipt of which is hereby acknowledged.

I hereby represent and covenant that no assignment, sale, agreement or encumbrance has been or will be made or entered into that would conflict with the assignment of said inventions and improvements to the Assignee.

I further covenant for myself and my respective heirs, legal representatives and assigns, to assist the Assignee in handling various procedures, tasks and documentation in connection with this assignment, including, but not limited to, providing to the Assignee promptly upon the request of the Assignee all pertinent facts and documents relating to said invention and improvements, and said patents, said legal equivalents or other legal instrument as may be known and accessible to me and testifying as to the same in any interference, litigation, or proceeding relating thereto, and promptly executing and delivering to the Assignee or its legal representative any and all papers, documents, instruments or affidavits in connection with obtaining, maintaining, issuing or enforcing said application, said inventions and improvements, and said patents, said equivalents and other legal instrument which may be necessary or desirable to carry out the purposes thereof.

Inventor : Fan Zhang et al.
Appl.No. : 17/147,770
Filed : January 13, 2021
Page : 4 of 4

Docket No. : 088453-8819 US00

I hereby authorize and request the Commissioner of Patents and Trademarks to issue one or more patents in the United States for said inventions and improvements to SK hynix Inc. as assignee of the entire interest, for the sole use and benefit of Assignee, its successors and assigns.

I am competent to execute the above declaration and assignment. I hereby have duly executed the declaration and assignment below with my name.

Full name of inventor: FAN ZHANG

Inventor's signature:  _____

Date: 3/18/2021

Perkins Coie LLP
P.O. Box 1247
Seattle, Washington 98111-1247
Telephone: (858) 720-5700
Facsimile: (206) 359-7198

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Fan Zhang et al.

Application No.: 17/147,770

Filed: January 13, 2021

For: GAUSSIAN MODELING FOR SOFT-READ
THRESHOLD ESTIMATION IN NON-VOLATILE
MEMORY DEVICES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION AND ASSIGNMENT BY THE INVENTOR
UNDER RULE 37 C.F.R. § 1.63 EFFECTIVE ON SEPTEMBER 16, 2012

I, Aman Bhatia, of San Jose, CA, hereby declare that:

I believe I am the sole original inventor or an original joint inventor of a claimed invention in a patent application entitled:

**GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-
VOLATILE MEMORY DEVICES**

the specification of which is attached hereto and identified as Attorney Docket No. 088453-8819.US00.

I believe the following persons are additional original joint inventors of the above-identified patent application:

Fan Zhang, of Fremont, CA;

Haobo Wang, of San Jose, CA; and

Meysam Asadi, of Fremont, CA.

I made, authorized to make, or hereby make or authorize to make the above-identified patent application at the U.S. Patent and Trademark Office.

I have reviewed and understand the contents of the above-identified patent application including the claims.

I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby acknowledge that any willful false statement made in the above declaration is punishable under 18 USC §1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

I hereby assign to SK hynix Inc., a corporation of Republic of Korea, having a place of business at 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-Do, Republic of Korea, and its successors and assigns (collectively hereinafter called “the Assignee”), the entire right, title and interest throughout the world in any and all inventions and improvements which are described in an application for United States Patent filed by me, entitled *GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-VOLATILE MEMORY DEVICES*, filed on January 13, 2021, and assigned U.S. Application Number 17/147,770. I authorize and request an attorney appointed in said application to hereafter insert above the filing date and application number of said application when known.

This assignment includes the entire right, title and interest in said application, all legal equivalents thereof in any country, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions and improvements, including, but not limited to, all divisions, continuations, reissues, reexamination certificates, any and all certificates issued in any post-grant proceeding, and extensions of said applications and patents of the United States, foreign patents, utility models, and design registrations, and the right to claim priority based on the filing date of said application under the International Convention for

the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes, and the right to seek relief and recover all damages, including, but not limited to, a reasonable royalty, by reason of infringement or any other violation of patent or patent application rights. I authorize the Assignee to apply in all countries in my name or in the name of the Assignee for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements.

In addition, I hereby confirm the sale, assignment, and transfer to the Assignee of the entire right, title and interest throughout the world in said inventions and improvements that occurred by operation of an employment agreement between me and the Assignee existing at the time said inventions and improvements were made. Should I have any remaining interest, I hereby sell, assign, and transfer any right, title and interest I may have in said inventions and improvements anywhere in the world to the Assignee.

The foregoing assignments, sale and transfer have been made for good and valuable consideration, the receipt of which is hereby acknowledged.

I hereby represent and covenant that no assignment, sale, agreement or encumbrance has been or will be made or entered into that would conflict with the assignment of said inventions and improvements to the Assignee.

I further covenant for myself and my respective heirs, legal representatives and assigns, to assist the Assignee in handling various procedures, tasks and documentation in connection with this assignment, including, but not limited to, providing to the Assignee promptly upon the request of the Assignee all pertinent facts and documents relating to said invention and improvements, and said patents, said legal equivalents or other legal instrument as may be known and accessible to me and testifying as to the same in any interference, litigation, or proceeding relating thereto, and promptly executing and delivering to the Assignee or its legal representative any and all papers, documents, instruments or affidavits in connection with obtaining, maintaining, issuing or enforcing said application, said inventions and improvements, and said patents, said equivalents and other legal instrument which may be necessary or desirable to carry out the purposes thereof.

Inventor : Fan Zhang et al.
Appl. No. : 17/147,770
Filed : January 13, 2021
Page : 4 of 4

Docket No.: 088453-8819.US00

I hereby authorize and request the Commissioner of Patents and Trademarks to issue one or more patents in the United States for said inventions and improvements to SK hynix Inc. as assignee of the entire interest, for the sole use and benefit of Assignee, its successors and assigns.

I am competent to execute the above declaration and assignment. I hereby have duly executed the declaration and assignment below with my name.

Full name of inventor: AMAN BHATIA

Inventor's signature: 

Date: 1/23/2021

Perkins Coie LLP
P.O. Box 1247
Seattle, Washington 98111-1247
Telephone: (858) 720-5700
Facsimile: (206) 359-7198

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Fan Zhang et al.

Application No.: 17/147,770

Filed: January 13, 2021

For: GAUSSIAN MODELING FOR SOFT-READ
THRESHOLD ESTIMATION IN NON-VOLATILE
MEMORY DEVICES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION AND ASSIGNMENT BY THE INVENTOR
UNDER RULE 37 C.F.R. § 1.63 EFFECTIVE ON SEPTEMBER 16, 2012**

I, Haobo Wang, of San Jose, CA, hereby declare that:

I believe I am the sole original inventor or an original joint inventor of a claimed invention in a patent application entitled:

**GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-
VOLATILE MEMORY DEVICES**

the specification of which is attached hereto and identified as Attorney Docket No. 088453-8819.US00.

I believe the following persons are additional original joint inventors of the above-identified patent application:

Fan Zhang, of Fremont, CA;

Aman Bhatia, of San Jose, CA; and

Meysam Asadi, of Fremont, CA.

I made, authorized to make, or hereby make or authorize to make the above-identified patent application at the U.S. Patent and Trademark Office.

I have reviewed and understand the contents of the above-identified patent application including the claims.

I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby acknowledge that any willful false statement made in the above declaration is punishable under 18 USC §1001 by fine or imprisonment of not more than five (5) years, or both.

ASSIGNMENT

I hereby assign to SK hynix Inc., a corporation of Republic of Korea, having a place of business at 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-Do, Republic of Korea, and its successors and assigns (collectively hereinafter called "the Assignee"), the entire right, title and interest throughout the world in any and all inventions and improvements which are described in an application for United States Patent filed by me, entitled *GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-VOLATILE MEMORY DEVICES*, filed on January 13, 2021, and assigned U.S. Application Number 17/147,770. I authorize and request an attorney appointed in said application to hereafter insert above the filing date and application number of said application when known.

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the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes, and the right to seek relief and recover all damages, including, but not limited to, a reasonable royalty, by reason of infringement or any other violation of patent or patent application rights. I authorize the Assignee to apply in all countries in my name or in the name of the Assignee for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements.

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Inventor : Fan Zhang et al.
Appl.No. : 17/147,770
Filed : January 13, 2021
Page : 4 of 4

Docket No.: 088453-8819.US00

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I am competent to execute the above declaration and assignment. I hereby have duly executed the declaration and assignment below with my name.

Full name of inventor: HAOBO WANG

Inventor's signature: Haobo Wang

Date: 1 / 25 / 2021

Perkins Coie LLP
P.O. Box 1247
Seattle, Washington 98111-1247
Telephone: (858) 720-5700
Facsimile: (206) 359-7198

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SK hynix

Haobo Wang/Algorithm

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Fan Zhang et al.

Application No.: 17/147,770

Filed: January 13, 2021

For: GAUSSIAN MODELING FOR SOFT-READ
THRESHOLD ESTIMATION IN NON-VOLATILE
MEMORY DEVICES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION AND ASSIGNMENT BY THE INVENTOR
UNDER RULE 37 C.F.R. § 1.63 EFFECTIVE ON SEPTEMBER 16, 2012**

I, Meysam Asadi, of Fremont, CA, hereby declare that:

I believe I am the sole original inventor or an original joint inventor of a claimed invention in a patent application entitled:

**GAUSSIAN MODELING FOR SOFT-READ THRESHOLD ESTIMATION IN NON-
VOLATILE MEMORY DEVICES**

the specification of which is attached hereto and identified as Attorney Docket No. 088453-8819.US00.

I believe the following persons are additional original joint inventors of the above-identified patent application:

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Haobo Wang, of San Jose, CA.

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Inventor : Fan Zhang et al
Appl. No. : 17/147,770
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Page : 4 of 4

Docket No.: 088453-8819,US00

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I am competent to execute the above declaration and assignment. I hereby have duly executed the declaration and assignment below with my name.

Full name of inventor: MEYSAM ASADI

Inventor's signature: *Meysam Asadi*

Date: 1/22/2021

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Seattle, Washington 98111-1247
Telephone: (858) 720-5700
Facsimile: (206) 359-7198

PATENT

REEL: 055636 FRAME: 0896

RECORDED: 03/18/2021