

## PATENT ASSIGNMENT COVER SHEET

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<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
LIANG HAN	02/28/2020
YANG JIAO	04/08/2020
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	ALIBABA GROUP HOLDING LIMITED
<b>Street Address:</b>	FOURTH FLOOR, ONE CAPITAL PLACE, P.O. BOX 847
<b>City:</b>	GEORGE TOWN, GRAND CAYMAN
<b>State/Country:</b>	CAYMAN ISLANDS
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16777711
<b>CORRESPONDENCE DATA</b>	
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<b>Phone:</b>	202-408-4000
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<b>ATTORNEY DOCKET NUMBER:</b>	12852.0339-00000
<b>NAME OF SUBMITTER:</b>	AARON J. CAPRON
<b>SIGNATURE:</b>	/Aaron J. Capron/
<b>DATE SIGNED:</b>	04/13/2020
<b>Total Attachments: 3</b> source=Assignment#page1.tif source=Assignment#page2.tif source=Assignment#page3.tif	

### ASSIGNMENT

WHEREAS I/We, the below-named inventor(s) (hereinafter referred to as Assignor(s)), of an invention entitled:

**EFFICIENT AND MORE ADVANCED IMPLEMENTATION OF RING-ALLREDUCE ALGORITHM FOR DISTRIBUTED  
PARALLEL DEEP LEARNING**

as claimed in United States Application No. 16/777,711 (Confirmation No. 8807), filed herewith on January 30, 2020,  
attached hereto, and as claimed in PCT International Application No. \_\_\_\_\_, filed herewith on \_\_\_\_\_,  
and attached hereto; and

WHEREAS, **Alibaba Group Holding Limited**, a corporation of Cayman Islands, whose post office address is Fourth Floor, One Capital Place, P.O. Box 847, George Town, Grand Cayman, Cayman Islands (hereinafter referred to as Assignee), is desirous of securing the entire right, title, and interest in and to this invention in all countries throughout the world, and in and to the application for United States Letters Patent on this invention and the Letters Patent to be issued upon this application and the PCT International application and all applications thereof, and all Letters Patent of the United States which may be granted thereon, and all reissues thereof, and all rights to claim priority in any foreign country on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of the application for United States Letters Patent and/or the PCT International application in any foreign country, 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, and all extensions, renewals, and reissues thereof; and I/We hereby authorize and request the Director of the United States Patent and Trademark Office and any official of any foreign country whose duty 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;

NOW THEREFORE, be it known that, for good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I/We, as Assignor(s), 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/our entire right, title, and interest in and to this invention, provisional Application No. \_\_\_\_\_, filed \_\_\_\_\_, (if any), and the application for United States Letters Patent and the PCT International application, and all divisions, and continuations thereof, and all Letters Patent of the United States which may be granted thereon, and all reissues thereof, and all rights to claim priority in any foreign country on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of the application for United States Letters Patent and/or the PCT International application in any foreign country, 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, and all extensions, renewals, and reissues thereof; and I/We hereby authorize and request the Director of the United States Patent and Trademark Office and any official of any foreign country whose duty 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/WE HEREBY covenant that I/We have the full right to convey the interest assigned by this Assignment, and I/We have not executed and will not execute any agreement in conflict with this Assignment;

AND, I/WE HEREBY further covenant and agree that I/We will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to me/us respecting this invention, and testify in any 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, its successors and assigns, 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, its successors and assigns;

AND, I/WE HEREBY authorize and request that the attorneys having Power of Attorney in the applications, insert in parentheses above, the filing date and application number of said applications when known.

SOLE/JOINT INVENTION  
(Worldwide Rights)  
Attorney Docket No. 12852.0339-00000  
Alibaba Ref. No. A24264US

IN TESTIMONY WHEREOF, I/We have hereunto set our hands.

Name: Liang HAN  
Address: Alibaba Group Legal Department  
400 South El Camino Real, Suite 400  
San Mateo, CA, 94402

By: Liang Han  
Date: 2/28/2020

Name: Jeff JIAO  
Address: Alibaba Group Legal Department  
400 South El Camino Real, Suite 400  
San Mateo, CA, 94402


By: \_\_\_\_\_  
Date: \_\_\_\_\_

IN TESTIMONY WHEREOF, I/We have hereunto set our hands.

Name: Liang HAN  
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San Mateo, CA, 94402

By: \_\_\_\_\_  
Date: \_\_\_\_\_

Name: Yang JIAO  
Address: Alibaba Group Legal Department  
400 South El Camino Real, Suite 400  
San Mateo, CA, 94402

By:   
Date: 4/8/2020