Attorney Docket No. 020859-010910US

U.S. DEPARTMENT OF COMMERCE United States Patent and Trademark Office

4. Application or patent number(s): A. Patent Application No.(s) US Patent Application Serial No. 12/275,190 filed November 20, 2008 Additional numbers attached? Yes No 5. Name and address to whom correspondence concerning document should be mailed: Name: David A. Hall Internal Address: TOWNSEND AND TOWNSEND AND CREW ILP Street Address: Two Embarcadero Center, Eighth Floor City: San Francisco State: California Zip: 94111-3834 Phone Number: (415) 576-0300 Fax Number: (415) 576-0300 Email Address: docket@townsend.com Signature Townsend and Crew Lip Signature	Form PTO-1595 (Rev. 11/08) OMB No. 0651-0027 (exp. 12/31/2008)	U.S. DEPARTMENT OF COMMERCI United States Patent and Trademark Offic	
To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below. 1. Name of conveying party(les) Anxiao Jiang Moshe Schwartz Jehoshua Bruck Additional name(e) of conveying party(les) attached?	RECORDATION FORM COVER SHEET		
1. Name of conveying party(les) Anxiao Jiang Moshe Schwartz Jehoshua Bruck Additional name(s) of conveying party(se) statches?			
Anxiao Jiang Moshe Schwartz Jehoshua Bruck Additional name(s) of conveying party(as) attached?			
Moshe Schwartz Jehoshua Bruck Additional name(s) of conveying party(les) attached? Ves No 3. Nature of conveyance/Execution Date(e): Execution Date(s) December 9, 12, 15, 2008 Assignment			
Jehoshua Bruck Additional name(s) of conveying perty(les) attached? Ves No 3. Nature of conveyance/Execution Date(s): Execution Date(s) December 9, 12, 15, 2008 Assignment			
3. Nature of conveyance/Execution Date(s): Execution Date(s) _ December 9, 12, 15, 2008		Internal Address.	
Execution Date(s)December 9, 12, 15, 2008	Additional name(s) of conveying party(les) attached? Yes No	Street Address: 1200 East California Blvd.	
Assignment	3. Nature of conveyance/Execution Date(s):		
Security Agreement	Execution Date(s) December 9, 12, 15, 2008	City: Pasadena	
Joint Research Agreement Government Interest Assignment Executive Order 9424, Confirmatory License Additional name(s) & address(es) attached? Yes No	Assignment Merger		
Government Interest Assignment Executive Order 9424, Confirmatory License Other Additional name(s) & address(es) attached? Yes No Additional name(s) & address(es) attached? Yes No Additional name(s) & address(es) attached? Yes No Additional name(s) & address(es) attached? Yes No Additional name(s) & address(es) attached? Yes No B. Patent No.(s) B. Patent No.(s) 5. Name and address to whom correspondence concerning document should be mailed: Name: David A. Hall Internal Address: TOWNSEND AND TOWNSEND AND CREW ILP Street Address: Two Embarcadero Center, Eighth Floor City: San Francisco State: California Zip: 94111-3834 Phone Number: (415) 576-0300 Fax Number: (415) 576-0300 Email Address: docket@townsend.com Signature Country: US Zip: 91125 Additional name(s) & address(es) attached? Yes No B. Patent No.(s) B. Patent No.(s) B. Patent No.(s) 6. Total number of applications and patents involved: 1 T. Total fee (37 CFR 1.21(h) & 3.41) \$ 40.00 Authorized to be charged to deposit account Enclosed None required (government interest not affecting title) 8. Payment Information Account Number 20-1430 Account Number 20-1430 Authorized User Name Townsend and Townsend and Crew Lite Signature Positional name(s) & address(es) attached? Yes No B. Patent No.(s) B. Patent No.(s) 6. Total number of applications and patents involved: 1 T. Total fee (37 CFR 1.21(h) & 3.41) \$ 40.00 Authorized to be charged to deposit account None required (government interest not affecting title) 8. Payment Information Account Number Townsend and Townsend and Townsend and Townsend and Crew Literature Townsend Townsend Townsend Townsend Townsend Townsend To	Security Agreement Change of Name	State: CA	
Executive Order 9424, Confirmatory License Other Additional name(s) & address(es) attached? Yes No. Application or patent number(s): A. Patent Application No.(s) US Patent Application Serial No. 12/275,190 filed November 20, 2008 Additional numbers attached? Yes No. 5. Name and address to whom correspondence concerning document should be mailed: Name: David A. Hall Internal Address: TOWNSEND AND TOWNSEND AND CREW LLP Street Address: Two Embarcadero Center, Eighth Floor City: San Francisco State: California Zip: 94111-3834 Phone Number: (415) 576-0300 Email Address: docket@townsend.com Fax Number: 415) 576-0300 Email Address: docket@townsend.com Signature Additional name(s) & address(es) attached? Yes No. B. Patent No.(s) B. Patent No.(s) 6. Total number of applications and patents involved: 1 7. Total fee (37 CFR 1.21(h) & 3.41) \$ 40.00 Authorized to be charged to deposit account Enclosed None required (government interest not affecting title) 8. Payment Information Account Number 20-1430 Account Number Townsend and Townsend and Crew Lite Signature Signature Figure 1 Address Add	Joint Research Agreement		
Additional name(s) & address(es) attached? Yes No. 4. Application or patent number(s): A. Patent Application No.(s) US Patent Application Serial No. 12/275,190 filed November 20, 2008 Additional numbers attached? Yes No. 5. Name and address to whom correspondence concerning document should be mailed: Name: David A. Hall	Government Interest Assignment	Country: US Zip: 91125	
4. Application or patent number(s): A. Patent Application No. (s) US Patent Application Serial No. 12/275,190 filed November 20, 2008 Additional numbers attached? Yes No 5. Name and address to whom correspondence concerning document should be mailed: Name: David A. Hall Internal Address: TOWNSEND AND TOWNSEND AND CREW ILP Street Address: Two Embarcadero Center, Eighth Floor City: San Francisco State: California Zip: 94111-3834 Phone Number: (415) 576-0300 Fax Number: (415) 576-0300 Email Address: docket@townsend.com Signature Townsend and Crew Lip Signature Townsend and Crew Lip California Crew Lip Constant Control Crew Lip Countrol Crew Lip Crew Crew Crew Crew Crew Crew Crew Crew	Executive Order 9424, Confirmatory License		
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Additional numbers attached? Yes No			
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Phone Number: (415) 576-0200 Fax Number: (415) 576-0300 Email Address: docket@townsend.com Phone Number: (415) 576-0300 Account Number 20-1430 Authorized User Name Townsend and Crew LI Townsend and Crew LI Signature Date	City: San Francisco	8. Payment Information	
Fax Number: (415) 576-0300 Email Address: docket@townsend.com Part Address: docket@townsend.com Signature Signature Account Number Townsend and Townsend and Crew Lt Tan 14, 2009 Signature			
Email Address: docket@townsend.com Townsend and Crew Lt 9. Signature: Signature Date	Phone Number: (415) 576-0200	Account Number	
9. Signature: David All Jack Tan. 14 2009 Signature Date	Fax Number: (415) 576-0300	Authorized User Name Townsend and	
Signature \ Date	Email Address: docket@townsend.com	Townsend and Crew LLi	
Parital A 11-11	9. Signature: Dan A Hall	Tan 14 2009	
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David A. Hall Total number of pages including cover Name of Person Signing Atty, Reg. No. 32,233 Name of Person Signing Atty, Reg. No. 32,233		Taran manning at leading an arrange at a second and a second a second and a second	

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1460, Alexandria, VA 22313-1450

PATENT

REEL: 022138 FRAME: 0069

Attorney Docket No.: 020859-010910US

Client Reference No.: CIT-5063

ASSIGNMENT OF PATENT APPLICATION

JOINT

WHEREAS, Anxiao Jiang; Moshe Schwartz; and Jehoshua Bruck all c/o California Institute of Technology of 1200 East California Blvd., Pasadena, CA 91125, hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention:

ERROR CORRECTING CODES FOR RANK

MODULATION

Date(s) of execution of Declaration:

Filing Date:

November 20, 2008

Application No.:

12/275,190; and

WHEREAS, California Institute of Technology, a corporation of the state of California, located at 1200 East California Blvd., Pasadena, CA 91125, hereinafter referred to as "ASSIGNEE," is desirous of acquiring an interest in the invention and application and in any U.S. Letters Patent and Registrations which may be granted on the same;

For good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have assigned, and by these presents do assign to Assignee all right, title and interest in and to the invention and application and to all foreign counterparts (including patent, utility model and industrial designs), and in and to any Letters Patent and Registrations which may hereafter be granted on the same in the United States and all countries throughout the world, and to claim the priority from the application as provided by the Paris Convention. The right, title and interest is to be held and enjoyed by Assignee and Assignee's successors and assigns as fully and exclusively as it would have been held and enjoyed by Assignors had this Assignment not been made, for the full term of any Letters Patent and Registrations which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, (a) cooperate with Assignee in the prosecution of U.S. Patent applications and foreign counterparts on the invention and any improvements, (b) execute, verify, acknowledge and deliver all such further papers, including patent applications and instruments of transfer, and (c) perform such other acts as Assignee lawfully may request to obtain or maintain Letters Patent and Registrations for the invention and improvements in any and all countries, and to vest title thereto in Assignee, or Assignee's successors and assigns.

PATENT REEL: 022138 FRAME: 0070 Assignment

61707676 ¥1

Attorney Docket No.: 020859-010910US

Page 2

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

Dated: 12/15/2008	Answar Tiest
SIGNATURE WITNESSED BY:	Anriao Jiang
Dated:	
	Signature of Witness
	Printed Name
Dated:	Moshe Schwartz
SIGNATURE WITNESSED BY:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Dated:	Signature of Witness
	(Against 61 / 15
	Printed Name
Dated:	Jehoshua Bruck
SIGNATURE WITNESSED BY:	
Dated:	Signature of Witness
	Printed Name

Page 2 of 2

PATENT REEL: 022138 FRAME: 0071 Assignment

Dated:

Attorney Docket No.: 020859-010910US

Page 2

IN TESTIMONY WHEREOF, Assignors have signed their names on the cates indicated.

SIGNATURE WITNESSED BY:	Anxiao Jiang
Dated:	O'EVIT.
	Signature of Witness
	Printed Name
Dated: 12 /9 2008	fel all
	Moshe Schwartz
SIGNATURE WITNESSED BY: Dated: \\\ \\ \\ \\ \\ \\ \\ \\ \\ \ \\ \\ \\	
	Signature of Witness
	SIVAN SAPATO
	Printed Name
Dated:	Jehoshua Bruck
SIGNATURE WITNESSED BY:	Jenosnus Blück
Dated:	
	Signature of Witness
	Printed Name
61707676 v1	

Page 2 of 2

Assignment

Attorney Docket No.: 020859-010910US

Page 2

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

Dated:	
	Anxino Jiang
SIGNATURE WITNESSED BY:	
Dated:	
	Signature of Witness
	
	Printed Name
Dated:	Moshe Schwartz
SIGNATURE WITNESSED BY:	
Dated:	
	Signature of Witness
	Printed Name
Dated: 12/12/08	Buch
SIGNATURE WITNESSED BY:	Jehoshua Bruck
	· Sahama La a carra
Dated: <u>/2//2/08</u>	Signature of Witness
	PATTAMA TYAWEESUP
	Printed Name
61707676 v1	

RECORDED: 01/20/2009

Page 2 of 2

PATENT REEL: 022138 FRAME: 0073