

ASSIGNMENT

This Assignment is made by:

Siva Muruganathan

**275 Denali Way
K2S 0R3 Stittsville ONTARIO
Canada**

Shiwei Gao

**78 Dragon Park Drive
K2J 0H5 NEPEAN ONTARIO
Canada**

(hereinafter referred to as "Assignor(s)") in favor, and for the benefit and behoof of, Telefonaktiebolaget LM Ericsson (publ), a corporation duly organized under and pursuant to the laws of Sweden and having its principal place of business at SE-164 83 Stockholm, Sweden (hereinafter referred to as "Assignee").

For good, sufficient and adequate consideration, the receipt of which is hereby acknowledged, the Assignor(s) have, as of the Effective Date, sold, assigned, transferred, and set over, and by these presents, and to the extent any transferable or assignable rights still remain with the inventor, do hereby sell, assign, transfer, and set over, unto the Assignee, its successors, legal representatives, and assigns the entire right, title, and interest in and to the following inventions, application(s) for Letters Patent, and any and all Letters Patent or Patents in all countries and pursuant to all multilateral treaty organizations, including Sweden, the United States of America, the Patent Cooperation Treaty and European Patent Convention, that may be granted therefor and thereon, and in and to any and all divisions, continuations, continuations-in-part, conversions and utility models of said application(s), and reissues and extensions of said Letters Patent or Patents, the same to be held and enjoyed by the Assignee, for its use and behoof and the use and the behoof of its successors, legal representatives, and assigns, to the full end of the term or terms for which Letters Patent, Patents and Utility Models may be granted as fully and entirely as the same would have been held and enjoyed by the Assignor(s) had this sale and assignment not been made:

SYSTEMS AND METHODS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

including, but not limited to, the application(s) for Letters Patent and Utility Model filed in:

Country	Application No.	File Date
PCT	PCT/IB2022/053114	April 04, 2022

The Effective date is the earliest date of the above listed Filing Date(s).

Assignor(s) hereby authorize and request Assignee's Attorneys to insert the serial number and filing date of said application(s) for Letter Patent or Utility Model, when known. The assignment of the above mentioned rights includes a transfer of the whole right to use a priority (including priority according to any convention, multilateral agreement, bilateral agreement and national law) of the above mentioned application(s) for Letter Patent and

ASSIGNMENT

Utility Model in all countries and multilateral treaty organizations wherein no residual rights shall remain with the Assignor(s). Assignor(s) hereby request that said Letters Patent, Patent or Utility Model be issued to Assignee as the Assignee of said inventions, the Letters Patent, Patent or Utility Model to be issued for the sole use and behoof of the Assignee, its successors, legal representatives, and assigns. Assignee alone hereinafter has the entire disposal of the invention and possesses entire ownership to any domestic and foreign patents or utility models granted thereafter. The rights granted hereunder shall include all rights to institute legal actions, obtain remedies and recover and retain damages in respect to said Letters Patent, Patent or Utility Model.

The Assignor(s) and Assignee hereby understand and agree that with the execution of this Assignment, to the extent necessary or appropriate, national and/or regional applications may be filed by the Assignee as the applicant and on behalf of the assignor.

To the extent Assignee is entitled to receive the rights hereunder pursuant to this Assignment, each of the Assignor(s) hereby covenants and agrees to and with the Assignee, its successors, legal representatives, and assigns, that, at the time of the Effective Date, the Assignor(s) were the sole and lawful owners of the entire right, title, and interest in and to the inventions and application(s) for Letters Patent or Utility Models above-mentioned, and that the same are unencumbered, and that the Assignor(s) have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

Further, and for the same consideration, the Assignor(s) hereby covenant(s) and agree(s) to and with the Assignee, its successors, legal representatives, and assigns that the Assignor(s) will, whenever counsel of the Assignee, or the counsel of its successors, legal representatives, and assigns, shall advise that any proceeding in connection with said inventions or said application(s) for Letters Patent, or any proceeding in connection with Letters Patent or Utility Model for said inventions, in any country and any multilateral treaty organization, including interference proceedings, is lawful and desirable, or that any division, continuation, continuation-in-part, conversion or Utility Model of any application(s) for Letters Patent or Utility Model, or any reissue or extension of any Letters Patent to be obtained thereon, is lawful and desirable, sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done for the procurement, maintenance, enforcement, and defense of Letters Patent or Utility Model for said inventions, without charge to Assignee, its successors, legal representatives, and assigns, but at the cost and expense of the Assignee, its successors, legal representatives, and assigns. If any of the Assignor(s) is prevented by any obstacles from signing said documents in person, this Assignment shall be valid as a Power of Attorney for the Assignee to sign these documents on behalf of any such Assignor(s) or, in the event of the death of the latter, the estate thereof.

This Assignment shall be governed by and construed under, and any dispute, controversy or claim related hereto shall be decided in accordance with, the laws of:

Sweden

without regard to the conflicts of laws provisions thereof. Any dispute, controversy or claim arising under, out of or relating to this Assignment and any subsequent amendments of this Assignment, including, without limitation, its formation, validity, binding effect, interpretation, performance, breach or termination, as well as non-contractual claims, shall be referred to and finally determined by arbitration in accordance with the WIPO Arbitration

ASSIGNMENT

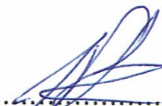
Rules. The arbitral tribunal shall consist of a sole arbitrator. The place of arbitration shall be in the country of the inventor's residence. The language to be used in the arbitral proceedings shall be English.

No modifications shall be made to this Assignment unless in writing and signed by each of the Assignor(s) and Assignee. If any of the provisions of this Assignment shall be deemed invalid or unenforceable, then the entire Assignment shall be construed as if not containing the particular invalid or unenforceable provision or provisions, and the rights and obligations of Assignee and Assignor(s) shall be construed and enforced accordingly. Assignee's failure to exercise any option made available as a result hereof, shall not be construed as a waiver of such provisions, rights, or options, or affect the validity of this Assignment. Assignor covenants and agrees that it will not take any actions in violation of this Assignment.

Subsequent assignment from any of the assignors to the assignee purporting to convey the subject matter specified herein for a particular country, patent office, or jurisdiction shall not invalidate any provision of this assignment and any such subsequent assignment shall act as a further confirmation of the assignment herein.

Date AUG. 12, 2022.....

Signature on behalf of
Assignee


.....
Jean-Pierre Fortin
Patent Agent

ASSIGNMENT

Title: SYSTEMS AND METHODS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

Date June 4, 2022

Signature of Assignor

Siva Muruganathan
Siva MuruganathanDate June 4, 2022

Witnessed by

Name:

Address:

Sagishan Ranjan
82 Randall Ave
Markham, Ontario
Canada, L3S 3S3Date June 4, 2022

Witnessed by

Name:

Address:

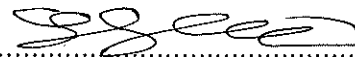
K. Raman
RANJAN KUMARASAMY
82 Randall Ave
Markham, Ontario
Canada, L3S 3S3

ASSIGNMENT

Title: SYSTEMS AND METHODS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

Date July 17, 2022

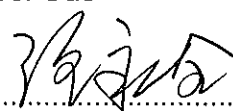
Signature of Assignor



Shiwei Gao

Date July 17, 2022

Witnessed by



Name:

Yongquan Qiang

Address:

43 Brechin Cres

Kanata, ON

K2W, 1E9

Date July 17, 2022

Witnessed by



Name:

WANG HAI

Address:

432 Tillsonburg Street

Kanata, ON

K2T 0C4

ASSIGNMENT

This Assignment is made by:

Siva Muruganathan

**275 Denali Way
K2S 0R3 Stittsville ONTARIO
Canada**

Shiwei Gao

**78 Dragon Park Drive
K2J 0H5 NEPEAN ONTARIO
Canada**

(hereinafter referred to as "Assignor(s)") in favor, and for the benefit and behoof of, Telefonaktiebolaget LM Ericsson (publ), a corporation duly organized under and pursuant to the laws of Sweden and having its principal place of business at SE-164 83 Stockholm, Sweden (hereinafter referred to as "Assignee").

For good, sufficient and adequate consideration, the receipt of which is hereby acknowledged, the Assignor(s) have, as of the Effective Date, sold, assigned, transferred, and set over, and by these presents, and to the extent any transferable or assignable rights still remain with the inventor, do hereby sell, assign, transfer, and set over, unto the Assignee, its successors, legal representatives, and assigns the entire right, title, and interest in and to the following inventions, application(s) for Letters Patent, and any and all Letters Patent or Patents in all countries and pursuant to all multilateral treaty organizations, including Sweden, the United States of America, the Patent Cooperation Treaty and European Patent Convention, that may be granted therefor and thereon, and in and to any and all divisions, continuations, continuations-in-part, conversions and utility models of said application(s), and reissues and extensions of said Letters Patent or Patents, the same to be held and enjoyed by the Assignee, for its use and behoof and the use and the behoof of its successors, legal representatives, and assigns, to the full end of the term or terms for which Letters Patent, Patents and Utility Models may be granted as fully and entirely as the same would have been held and enjoyed by the Assignor(s) had this sale and assignment not been made:

METHODS FOR DETERMINING NUMBER OF UL PT-RS PORTS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

including, but not limited to, the application(s) for Letters Patent and Utility Model filed in:

Country	Application No.	File Date
US	63/170001	April 02, 2021

The Effective date is the earliest date of the above listed Filing Date(s).

Assignor(s) hereby authorize and request Assignee's Attorneys to insert the serial number and filing date of said application(s) for Letter Patent or Utility Model, when known. The assignment of the above mentioned rights includes a transfer of the whole right to use a priority (including priority according to any convention, multilateral agreement, bilateral

ASSIGNMENT

agreement and national law) of the above mentioned application(s) for Letter Patent and Utility Model in all countries and multilateral treaty organizations wherein no residual rights shall remain with the Assignor(s). Assignor(s) hereby request that said Letters Patent, Patent or Utility Model be issued to Assignee as the Assignee of said inventions, the Letters Patent, Patent or Utility Model to be issued for the sole use and behoof of the Assignee, its successors, legal representatives, and assigns. Assignee alone hereinafter has the entire disposal of the invention and possesses entire ownership to any domestic and foreign patents or utility models granted thereafter. The rights granted hereunder shall include all rights to institute legal actions, obtain remedies and recover and retain damages in respect to said Letters Patent, Patent or Utility Model.

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Further, and for the same consideration, the Assignor(s) hereby covenant(s) and agree(s) to and with the Assignee, its successors, legal representatives, and assigns that the Assignor(s) will, whenever counsel of the Assignee, or the counsel of its successors, legal representatives, and assigns, shall advise that any proceeding in connection with said inventions or said application(s) for Letters Patent, or any proceeding in connection with Letters Patent or Utility Model for said inventions, in any country and any multilateral treaty organization, including interference proceedings, is lawful and desirable, or that any division, continuation, continuation-in-part, conversion or Utility Model of any application(s) for Letters Patent or Utility Model, or any reissue or extension of any Letters Patent to be obtained thereon, is lawful and desirable, sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done for the procurement, maintenance, enforcement, and defense of Letters Patent or Utility Model for said inventions, without charge to Assignee, its successors, legal representatives, and assigns, but at the cost and expense of the Assignee, its successors, legal representatives, and assigns. If any of the Assignor(s) is prevented by any obstacles from signing said documents in person, this Assignment shall be valid as a Power of Attorney for the Assignee to sign these documents on behalf of any such Assignor(s) or, in the event of the death of the latter, the estate thereof.

This Assignment shall be governed by and construed under, and any dispute, controversy or claim related hereto shall be decided in accordance with, the laws of:

Sweden

without regard to the conflicts of laws provisions thereof. Any dispute, controversy or claim arising under, out of or relating to this Assignment and any subsequent amendments of this Assignment, including, without limitation, its formation, validity, binding effect, interpretation, performance, breach or termination, as well as non-contractual claims, shall

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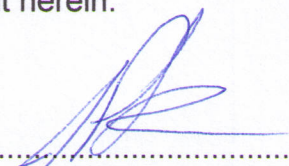
be referred to and finally determined by arbitration in accordance with the WIPO Arbitration Rules. The arbitral tribunal shall consist of a sole arbitrator. The place of arbitration shall be in the country of the inventor's residence. The language to be used in the arbitral proceedings shall be English.

No modifications shall be made to this Assignment unless in writing and signed by each of the Assignor(s) and Assignee. If any of the provisions of this Assignment shall be deemed invalid or unenforceable, then the entire Assignment shall be construed as if not containing the particular invalid or unenforceable provision or provisions, and the rights and obligations of Assignee and Assignor(s) shall be construed and enforced accordingly. Assignee's failure to exercise any option made available as a result hereof, shall not be construed as a waiver of such provisions, rights, or options, or affect the validity of this Assignment. Assignor covenants and agrees that it will not take any actions in violation of this Assignment.

Subsequent assignment from any of the assignors to the assignee purporting to convey the subject matter specified herein for a particular country, patent office, or jurisdiction shall not invalidate any provision of this assignment and any such subsequent assignment shall act as a further confirmation of the assignment herein.

Date Feb 25, 2022

Signature on behalf of
Assignee


Jean-Pierre Fortin
Patent Agent

ASSIGNMENT

Title: METHODS FOR DETERMINING NUMBER OF UL PT-RS PORTS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

Date... January 28, 2022 Signature of Assignor

Sivamuruganathan
Siva Muruganathan

Date... January 28, 2022 Witnessed by

Name:

Address:

T. Tharmanathan
Tharsika Tharmanathan
68 Alderbury Drive
Markham ON
Canada L3S 3G1

Date... January 28, 2022 Witnessed by

Name:

Address:

T. Veathenayshi
Vetha Tharmanathan
68 Alderbury Drive
Markham ON
Canada L3S 3G1

ASSIGNMENT

Title: METHODS FOR DETERMINING NUMBER OF UL PT-RS PORTS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH

Date Jan. 28, 2022 Signature of Assignor


Shiwei Gao

Date Jan. 28, 2022 Witnessed by

Name:

Yuan Lin

Address:

78 Dragon Park Dr.

Nepean Ont. Canada

K2J 0H5

Date..... Witnessed by

Name:

Address:

Second witness signature cannot be provided
due to the COVID-19 sanitary emergency.

**DECLARATION (37 CFR 1.63) FOR UTILITY OR
DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Attorney Docket
Number

P101905WO01

Title of Invention	SYSTEMS AND METHODS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH
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As the below named inventor, I hereby declare that:

This declaration
is directed to:

- ☐ The attached application, or
- ☒ United States application or PCT international
application number PCT/IB2022/053114, filed on April
04, 2022

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention
in the application.

I have reviewed and understand the contents of the above identified application,
including the claims, as amended by any amendment specifically referred to above.

I am aware of the duty to disclose information which is material to patentability as
defined in 37 CFR 1.56, including for continuation-in-part applications, material
information which became available between the filing date of the prior application and
the national or PCT international filing date of the continuation-in-part application.

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

LEGAL NAME OF INVENTOR

Inventor: Siva Muruganathan

Date (Optional):

Signature:

Sivamuruganathan

June 4, 2022

**DECLARATION (37 CFR 1.63) FOR UTILITY OR
DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Attorney Docket
Number

P101905WO01

Title of Invention	SYSTEMS AND METHODS FOR NON-CODEBOOK BASED MULTI-TRP PUSCH
-------------------------------	---

As the below named inventor, I hereby declare that:

This declaration
is directed to:

- ☐ The attached application, or
- ☒ United States application or PCT international
application number PCT/IB2022/053114, filed on April
04, 2022

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention
in the application.

I have reviewed and understand the contents of the above identified application,
including the claims, as amended by any amendment specifically referred to above.

I am aware of the duty to disclose information which is material to patentability as
defined in 37 CFR 1.56, including for continuation-in-part applications, material
information which became available between the filing date of the prior application and
the national or PCT international filing date of the continuation-in-part application.

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

LEGAL NAME OF INVENTOR

Inventor: Shiwei Gao

Date (Optional):

Signature:



July 20, 2022